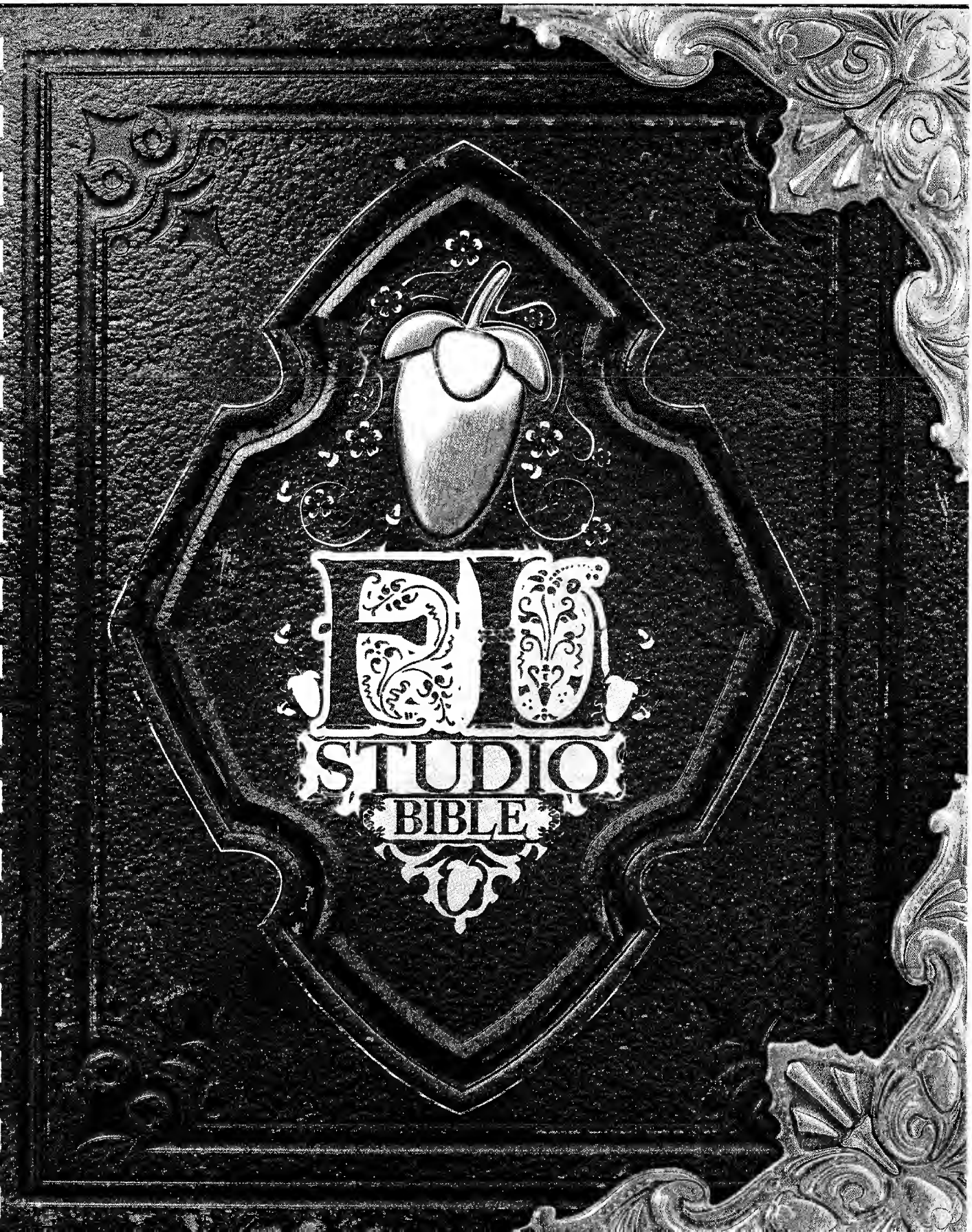
3D
STUDIO
BIBLE

THE FL STUDIO BIBLE

Making music happen

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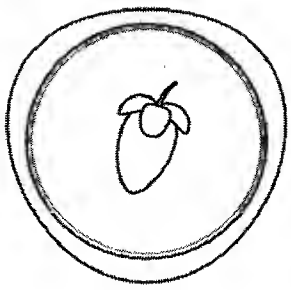

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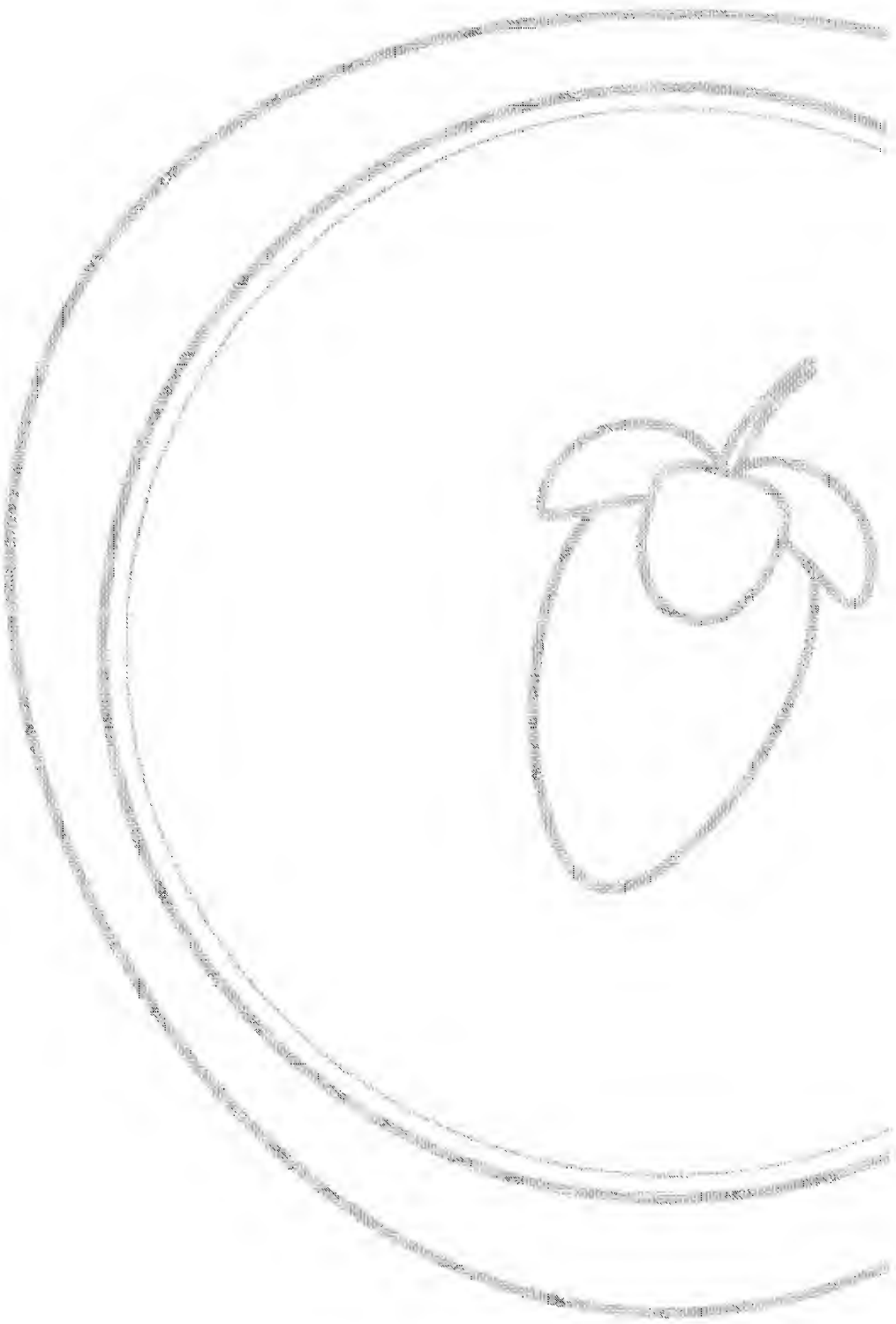

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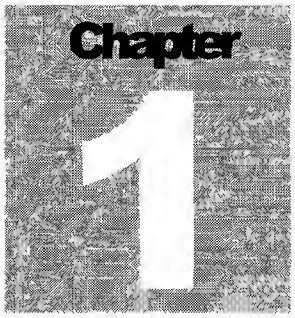
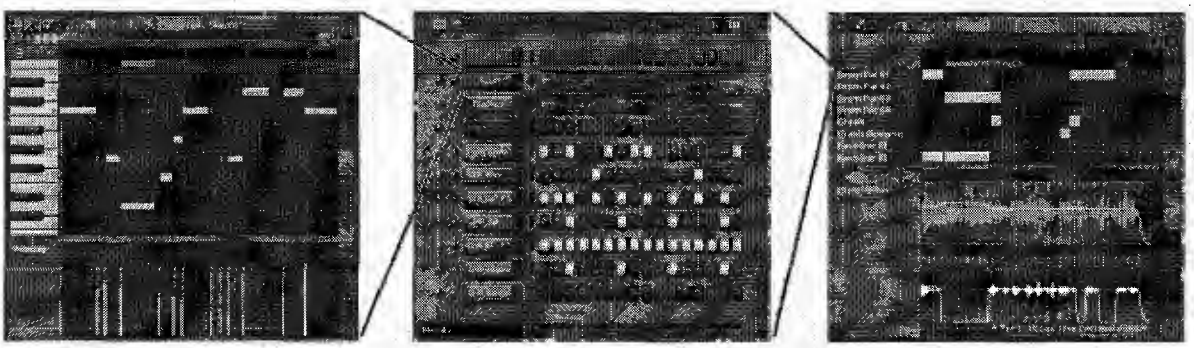


'What's that noise?'
Mothers

Introduction to FL Studio

Welcome to FL Studio. You have in your possession a full-featured sequencer and audio production environment perfect for the creation of any style of music. Image-Line is excited to be leading the development of music production software at a time when we can truthfully say - the only limitation is your own imagination, really! Through the pages of this book we hope to share that excitement and help you see the almost limitless musical possibilities at your disposal.

Understanding FL Studio is easier when the 'work flow', that is, the logical sequence of activities undertaken to make a music track, is clear in your mind. There are five basic steps to creating a music track:



1. **Instrumentation** – Instruments/generators make the sounds used in the song and are arranged vertically in the channel window (center panel above). Instruments can be native FL plugins, samples or virtual synthesizers (VSTi, DXi etc). Think of the channel window as a rack of synthesizer/sampler modules. See page 70 for more detail on instruments.

2. **Composition/Sequencing** – The musical elements are played live via MIDI keyboard or entered manually in the Step Sequencer or Piano Roll (lower middle and left panels respectively). These notes drive each instrument with up to 999 unique sequence 'stacks', known as 'patterns'. The length of each pattern is determined by the number of bars covered by the longest note sequence or automation data.

3. **Arrangement** - Pattern blocks are arranged and repeated in the Playlist window (upper right panel) along with controller data and audio clips such as track length vocals (lower right panel).

4. **Mixing** - The sound from the Channel instruments is routed through the Mixer where levels are set and effects (FX) are added such as reverberation (reverb), chorus, delays etc (the mixer is not shown, see page 182). Almost all aspects of the mix are automatable so fader movements and knob changes can form part of the overall performance.

5. **Exporting/Rendering** - The final mix is exported from FL Studio to .WAV or MP3 file format in a non-real time process called rendering (the export panel is not shown, see page 274).

Naturally, the five steps outlined above are only a summary of the general workflow in FL Studio. We are sure that if you take the time to read this book you will discover features that will make you more productive and help you achieve your music goals.

Setting Up Your Studio

Remember that making music with FL Studio is not all about software (if only it were that simple). The following is some advice for your work-space.

Comfortable setting: You will be sitting (transfixed) for extended periods so make sure you look after your back with suitable ergonomic seating and space to maneuver. Google the word 'ergonomics' and start reading.

Quiet location, including quiet computer: It's hard to hear the subtle details of a mix if you are competing with the TV, radio or you have five case fans, making a noise that would put your sisters hair-dryer to shame, blaring full-bore to keep your over-clocked LAN-party monster from melting a hole in the floor. Quiet PCs and components are available. See the tip.

TIP: When you next purchase or build a PC remember to be obsessed about quiet parts. The main causes of noise are the case and power-supply fans. These usually run at far higher speeds than necessary, which does little more than scare mosquitoes and make a racquet. Quiet fans run at lower speeds and have ball-bearing spindles. 'Ultra quiet' versions of most PC components are available, just **search 'quiet pc' on Google**.

Quality speakers (monitors): If you don't have a pair already you should aspire to owning 'Near Field Monitors' (NFM). These are speakers designed to be used in audio-production work. They are called 'Near Field' in that the principle is to sit close to them so that the direct sound from the speaker is less open to interference from reflected sound of the room. NFMs also have a (relatively) flat frequency response so that what you hear is not affected by the speakers own sound (called coloration). In truth ALL speakers color the sound, it's just that NFMs are designed with low coloration in mind. That's not to say that you can't make great music with FL studio with a pair of PC, Hi-Fi speakers or headphones, it is possible to learn how these sound and compensate for them in your mixes. Indeed, we strongly encourage you to start out with these and learn their limitations, then, when you do buy a pair of NFMs you will be selecting from a position of experience. Having the right tool for the job certainly makes the complex task of mixing much easier.

Two (or more) displays: The use of FL Studio is particularly efficient with at least two displays. The extra screen space allows you to spread the windows and panels around with far less clicking and moving components around. There is no better way to impress onlookers than with a wall of 21" LCD displays.

In summary, we don't want to discourage you into thinking you can't make great music without specific hardware, rather we ask you to keep seeking the ideal as you progress in your craft. We can imagine more than one great producer started out mixing on a pair of speakers scavenged from an old car. However, making great sounding tracks is a lot easier if you have the right tools,, including FL Studio.

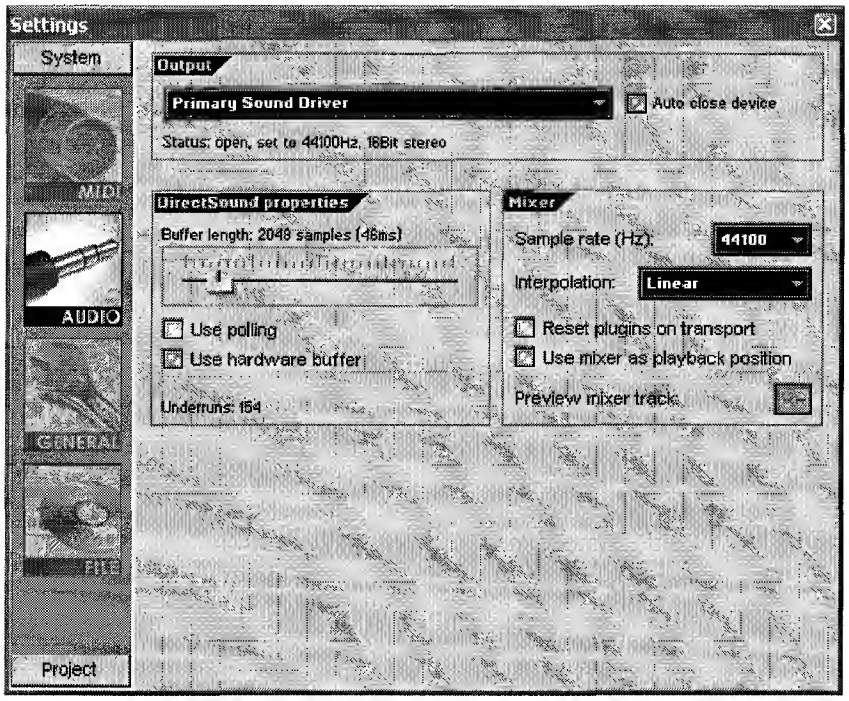
TIP: Hi-Fi speakers can be as good, or better, than so called 'Monitors'. However, good Hi-Fi speakers will be as, or more expensive, and harder to choose because there are many more 'poor' Hi-Fi speakers on the market. You will also hear the terms 'Active' and 'Passive' monitors. Active monitors have built-in amplification, passive monitors will need a separate amplifier to drive them. Which is better? If set up correctly - neither. It comes down to your personal preferences. However, if you are at all confused, go for active near field monitors. This will narrow your options to something manageable and you will purchase speakers designed for the task of mixing music.

NOTE: Registered FL Studio users have access to **free samples** at **www.samplefusion.com**. There you will find vocals, drum loops, bass sounds, pads, orchestral sounds, world music samples and more. At the time of this draft there were fifteen CDs full of samples. Samplefusion is owned and run by Image-Line, so start downloading today.

Getting Started: Audio Settings

The first time you install and run FL Studio there are a few settings you can use to optimize the performance of the program. Audio processing at FL Studio's level of sophistication is highly demanding on PC hardware so **some 'optimization' may be required to eliminate audio glitches**. The audio optimization process is described below -

System Settings: When you first run FL Studio, you may be confronted with the **audio settings** dialog box (see page 266 for a detailed discussion). If not, **press F10** on your keyboard to bring it up, **click on the AUDIO icon** where you can select a sound card and options. Two important steps are:



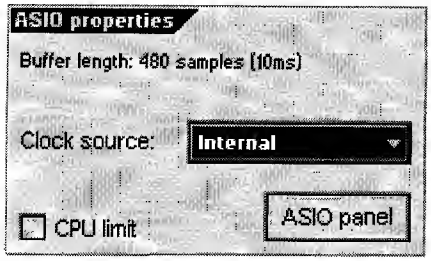
1. Output: Select an output driver from the list in the pull-down menu. If you don't know which one to choose, just leave it as it is. Later on, if you have sound problems, you can come back to this screen (by pressing F10), and experiment with the other options. If a device with **ASIO** in the name is showing, select that, as it will be more efficient.

2. DirectSound Properties: The **Buffer length** is important. If the buffer is long, the sound from FL Studio is less likely to glitch, however the delay between actions in FL Studio and the result will take longer to hear (latency). If the latency is too short you are more likely to get choppy sound, however FL Studio will feel more responsive so short settings are best. You may be able to get the latency as low as 10ms, although for a SoundBlaster Live, 20-30ms is typical. **Try to set the Buffer length in the 5-10 ms range without 'underruns',** anything less than 5 ms pushes up CPU usage with little noticeable improvement in responsiveness.

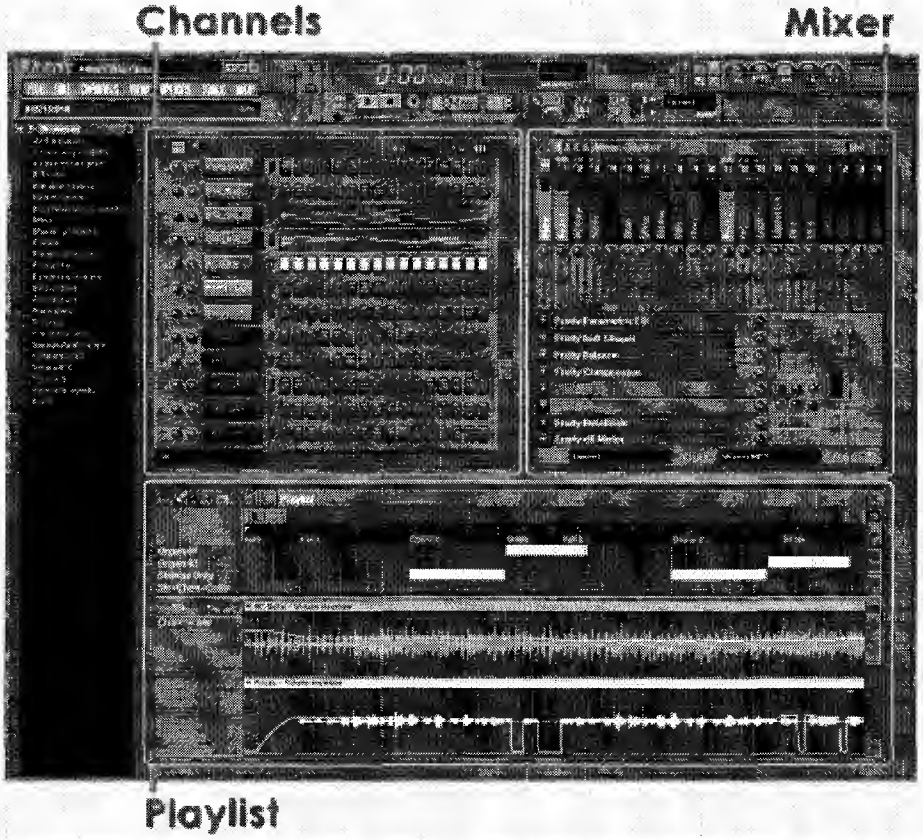
The **underrun** count shows how hard you are pushing your hardware. Each underrun represents a case where your soundcard audio buffer ran out of data and is probably associated with a **crackle or pop in the sound**. It's not damaging, just very annoying.

Try switching the **Use Polling option** and **Use hardware buffer** switches to see if you can reduce latencies further. Two switches with two positions each give four combinations, so experiment and see what produces the fewest underruns.

ASIO properties: If you have selected an **ASIO** driver in the **Output** drop-down panel the DirectSound properties panel will change to show the **ASIO Properties panel** as seen here. The ASIO properties dialog allows the ASIO audio output buffer to be set. Click on the **ASIO panel** button in the lower right corner and set the latency around **10ms range**. ASIO is a more sophisticated interface between your soundcard and your PC and allows much lower latencies without audio glitches. If ASIO is not available to you then this probably means that your soundcard does not natively support ASIO drivers. However, all hope is not lost, see the note on page 242. **Audio input to FL is only available through ASIO.**



The Main Screen: After you close the Environment Settings window, you'll be looking at the main screen. The sections may be arranged differently on your system, however, the FL Studio interface is all about windows within windows, and these are described further in the next chapters.



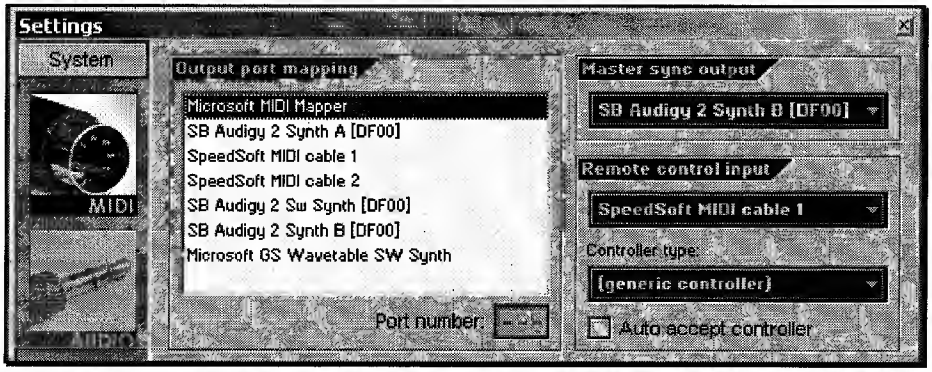
TIP: One way to **reduce CPU** can be to increase the **audio buffer.** Press **F10**, select audio settings, set the audio buffer to 100ms and close the window. Live keyboard playing will be difficult with this latency, although manual editing will be fine. See page 267 for more ideas.

Getting Started: Connecting Keyboards and Controllers

The purpose of this section is to help you connect a musical keyboard, or controller, to your computer and use it to play synthesizers or control knobs inside FL Studio.

MIDI connection: If you have a MIDI keyboard you will need to have a MIDI cable (two if you also want to send MIDI data out of FL Studio) and MIDI connector on your PC.

1. Turn off the PC and MIDI keyboard. Connect the MIDI out from the keyboard to the MIDI in on your PC. **You may not have a MIDI connector on your PC.** They are inexpensive and available from most music stores. Typically, they connect as an adaptor to the Joystick port on a soundcard (ask at a music store). Turn on the keyboard and PC, and open FL Studio.
2. Press **F10** on your typing keyboard and click the MIDI icon (or **Options > MIDI settings**).
3. Set the **Remote control input** menu to MIDI (this will be different to that shown depending on your card. Look for something with MIDI in the name).
4. Select **generic controller** in the Controller type menu, unless you can see your particular device in the list, then select that.
5. Turn on **Auto accept controller** and you are done. See '**Did it work?**' below.



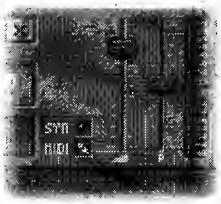
NOTE: The term **MIDI** (Musical Instrument Digital Interface) is used frequently throughout this book. MIDI data such as 'note on', 'note off', 'note velocity' and 'pitch' information is **not an audio connection.** MIDI is piano keystroke information, similar to the data from alphanumerical (typing) keyboards connected to PCs. In recent years, **USB** and **FireWire**, PC-specific connection standards, are being adopted by music equipment manufacturers. As MIDI has a long history connecting music gear (since 1983), the term may be used loosely in this book to mean any connection between FL Studio and an external controller device. It's highly likely you have a **USB controller keyboard** or **FireWire interface**, in which case the principle is the same – sending note and knob controller data to FL Studio. **If you are having trouble setting up a MIDI device** we recommend **www.midiox.com** this will allow you to monitor the output of your device to check it is working OK.

USB & FireWire: If you have a USB or FireWire device the installation process is very similar to that of a MIDI controller.

1. **Install the drivers** for your USB or FireWire device, following the manufacturer's installation instructions. This usually involves plugging in the device, allowing Windows to detect it, and then following the installation wizard steps.
2. Press **F10** on your typing keyboard (or click **Options > MIDI settings**).
3. Set the **Remote control input** menu to the name of the device you have. It, or the manufacturer's name, should appear if the driver has been correctly installed.
4. Select **generic controller** in the Controller type menu, unless you can see your particular device in the list, then select that.
5. Turn on **Auto accept controller** and you are done.

Did it work?

If the installation was successful, the MIDI light (to the left of the Master Level slider), should flash each time you press a note OR move a knob and data is received (**this is the same for MIDI, USB or FireWire**). If this does not seem to be the case, then try the following:



1. **Test your speakers** - make sure you can hear sound on your PC with Windows Media Player (or similar). Perhaps your sound is not on or the volume is down?
2. Close FL Studio and open it again.
3. Close FL Studio, turn off your device, reboot your PC, turn on your device and open FL Studio.
4. Repeat the relevant steps in the procedures outlined in the appropriate connection section (MIDI or USB & FireWire) above.

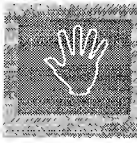
The MIDI light flashes yellow or red (may look orange), Yellow means a message was received but not aced on by FL Studio (an unlinked knob was moved for example). Red (orange) means the data was received and acted on used by FL Studio.

To play an instrument using your newly connected controller, select a channel with an active instrument and play the keyboard. Switching to other channels will change the instrument

TIP: To link a knob on your controller to one in FL Studio, right-click on the FL knob and select '**Link to controller...**' from the menu, then move the knob on the hardware controller. 3rd party plugin knobs require a slightly different procedure – see page 74.

Getting Started: The Interface

This section will help you familiarize yourself with the main controls and menus in FL Studio.



TIP: Hover the mouse over everything and look at the **Hint Bar** (page 16) while you do. Different icons will explain what actions are possible with that icon. There is no better way to **discover features** in FL Studio.

Knobs (wheels) & Sliders

Common Features - All knobs and sliders in FL Studio are instances of the same type of graphic control type and behave similarly. To set the value of any of them you can left-click them and drag - up/down (left/right for horizontal sliders). **Some knobs will pause** as you move them through important values (for example: every 100 cents for pitch). To avoid this hold down the SHIFT key as you move the knob.

Fine Adjustments - To fine-tune the value of a control, hold the CTRL key while dragging. Holding ALT and left-clicking a control resets it to its default value **as does middle clicking (wheel).**

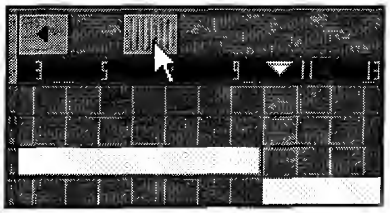
Snapping - Some of the controls will pause ('snap' into place for useful values) for a while in their default values while you tweak them. To avoid this, hold down the SHIFT key while using a control.

LCDs

The value of the LCD control is normally **set by 'dragging' the screen** with your left mouse button up and down (just like a knob). It is also possible to increment or decrement the LCD value **one step** at a time: place your mouse pointer over the top (to increase) or bottom (to decrease). The pointer shows the increase or decrease cursor respectively. Now click to change the LCD value.

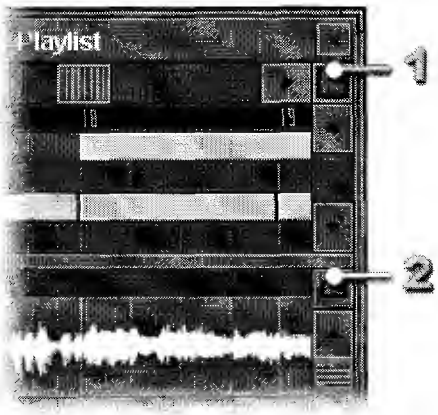
TIP: If you have a **middle mouse button** (often a mouse wheel can be clicked) this can **will reset a knob or slider to the default value**.

Scrollbars



The scrollbars in the Piano Roll and Play List (**ribbed slider**, left) have a special feature so that if they are dragged with a right mouse button, instead of using the left, this will allow free vertical and horizontal movement of the window. This is a great way of moving around the Playlist window when screen space is limited, for example.

Zoom



The Playlist and Piano roll have **zoomable areas**. Where zooming is possible you will notice a rectangular box. Click on this with your mouse and move up/down to change the zoom level.

1) **Horizontal zoom** - The box shows the state of zoom. Max: , Min:

2) **Vertical zoom** – Max: , Min:

Presets

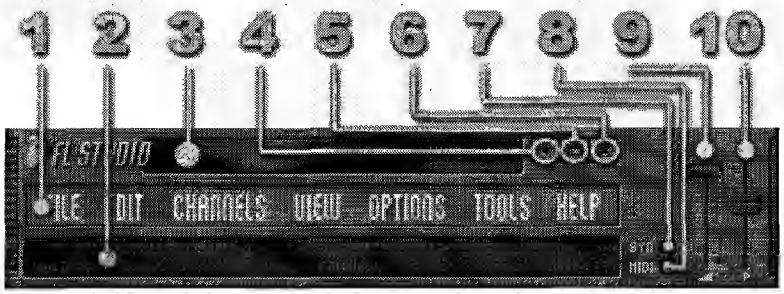
Right click on the double arrows ( ) in the top right corner of Instrument or FX wrappers to bring up the preset menu. Select a preset from the list to load it. **Left click** on the right arrow to step forward and left arrow to step back through the preset list sequentially.

The Menu Bar

The menu bar along the top of FL Studio is the control centre for the program. From here all major functions and controls can be accessed. The panels are lockable. These are described in detail below.

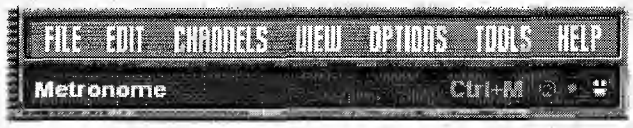
Main Panel

The Main panel contains some essential controls for each application - the title bar, the main menu bar, a hint panel and the minimize, maximize/restore and close buttons. It also contains the global volume and pitch controls.

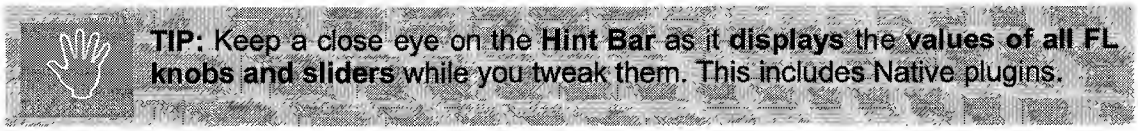


1) ***File*** – Save and load project files.

2) ***Hint Bar***- Position the cursor over any control and a short description will appear. On the right you will find different icons explaining what the hovered item is capable of :



From left to right - control name (far left), keyboard Shortcut (Ctrl+M), item can be MIDI controlled, item is automatable, item can be right-clicked.



TIP: Keep a close eye on the **Hint Bar** as it **displays** the **values of all FL knobs and sliders** while you tweak them. This includes Native plugins.

3) ***Title Bar*** – Displays the name of the song currently opened in FL Studio. The name is the songs Title or File Name if no title is available.

4) ***Minimize*** - Hides the main window.

5) ***Maximize/Restore*** - Maximizes/restores FL Studio main window.

6) ***Close*** *(Alt+F4)* - Closes FL Studio. Fortunately, FL Studio will ask you to save any unsaved projects.

7) ***Sync LED*** - Blinks orange at the beginning of each beat and yellow at the beginning of each bar.

TIP: The flashing **Sync LED** works this way only when the Enable MIDI Master Sync option in the Options menu is checked.

8) ***MIDI Activity LED*** - Blinks when MIDI data is received from the MIDI/USB input device. This is a quick way to check if your controller is communicating with FL Studio. Remember to set up your MIDI configuration correctly first in the MIDI Settings Dialog (page 264).

9) ***Master Level*** - Sets the main volume in FL Studio.

TIP: You should leave the **Master Level** at the default setting (100%, 0 dB gain), this can go up to 125%. It's better to control the volume of your mixes using the **Master Volume** in the mixer. The **Master Level** is provided as a global volume control when you are listening to completed projects. See page 181 for more detail.

10) ***Main Pitch*** - Globally sets the main pitch of generators in FL Studio.

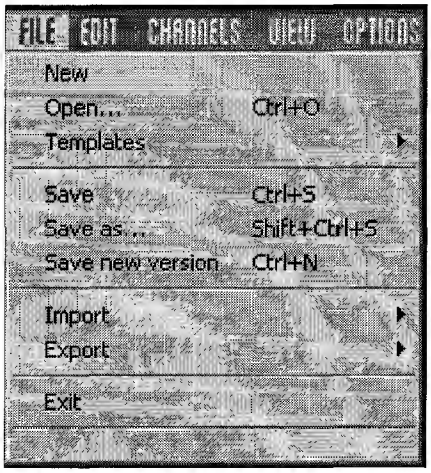
TIP: The **Main Pitch** control works by globally transposing all pattern and piano-roll note data. As **Audio Clips** are not 'note' data and so **remain unaffected** by the Main Pitch control. The technical explanation is that 'unexpected' results may be experienced if you use this control with mixed instrument and audio-clip projects' ☺ You can set which channels respond to the Main Pitch using the 'Enable Main Pitch' switch in the channel settings dialog box (page 39).

Main Menus

File Menu

The File menu contains commands for managing files within FL Studio.

- ***New*** - Opens a new, empty, project using the last selected drum kit as a starting point. You will be prompted to save any changes to the currently opened project.



- ***Open*** *(Ctrl+O)* - Opens an existing project. The lower part of the Open File drop down menu will have a 'last opened' file list. This list will build up as you use FL Studio and is a quick way of reopening projects you have been working on.

- ***Templates*** - Contains a submenu with project presets you can use for quick start of a new project. This can be used to quickly open an 808 style set of percussion for example or the 'club basic' preset. You will be prompted to save changes to the currently opened project. You can create your own templates by saving an FL Studio project to the 'Data\Projects\Templates' folder.

TIP: Making your own templates will allow you to start new projects with FL Studio configured just the way you want: 1. Load the default template. 2. Configure channels with the instruments and routing you prefer. 3. Save the FLP to Data\Projects\Templates, within the FL Studio installation directory - any name is fine. 4. **Load the saved template back**. 5. Next time FL Studio opens, your saved FLP will be the default template.....Why do I get this sneaking feeling 10,000 users just saved a template called *'any name is fine'* in their template folder ☺

- ***Save*** *(Ctrl+S)* - Updates your current project by overwriting its last saved copy on disk. If the current project was never saved before, this command works like 'Save As'.

- ***Save As*** *(Shift+Ctrl+S)* - Lets you save your current project under a different name and/or format. For a list of available formats, go to the File Formats pages. The Save File dialog in FL Studio is enhanced with a Favorites section.

- ***Save New Version*** - Saves the current project in a file with unique name (so it won't overwrite any existing file). For example, if you have a project called 'My-Project', this

command saves a file 'My-Project_2'. Next time it will be 'My-Project3' etc. This is useful for quickly saving versions of the project without overwriting the previous file.

- ***Export*** - Converts the current project to various file formats. For a complete list of file types you can export to, go to 'File Formats' pages. The lower part of the Export drop down menu has presets 'Favorites' feature.

- ***Import*** - Loads files that are not in FL Studio native projects. For a complete list of file types you can import into FL Studio, go to the Open/Import File Formats section. The Import File dialog in FL Studio is enhanced with a Favorites section.

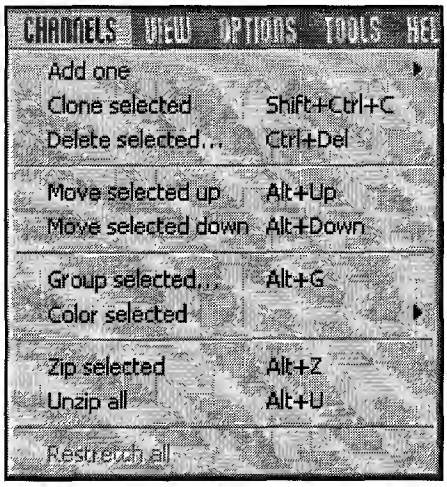
- ***Export/Project Data*** - Saves copies of all samples, TS404 shapes, SimSynth/DrumSynth presets and other plugin data in your current project into a single folder of your choice.

- ***Export / Project Bones*** - A shortcut for exporting all generator/effects settings as presets (.FST files) and score/automation data as score files (.FSC files) used in the current project. Also, a .NFO file will be created in the folder you selected to store the preset/score data, that is used by the Browser. A useful feature when you want to merge parts from one project into another.

- ***Exit*** - Closes FL Studio. You will be prompted to save any changes to your current project.

- ***History List*** *(Alt+ 1-0)* - Appears as a list of the eight most recently opened projects at the bottom of the File menu, with the most recent one at the top.

Channels Menu

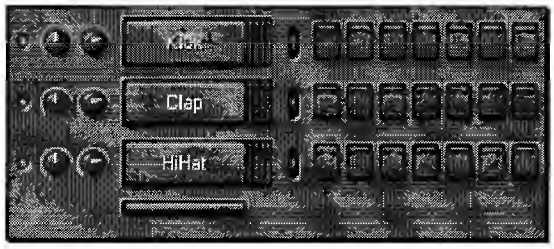


The Channels menu contains commands for managing channels. Channels are the place where sound generators reside. These are discussed later in more detail, however a quick overview is presented below.

- ***Add One*** - Contains a list of all generators selected as favorites. Choosing a generator from this menu will add a single instance of it at the bottom of the Step Sequencer window. Click 'More' to open the Select plugin window, which contains a list of all generators present in FL Studio (including VSTi and DXi). Double-click a generator name to add it in the Step Sequencer. Click the check box preceding each name to mark it as a favorite (all plugins preceded by a check mark will appear in the favorites list).

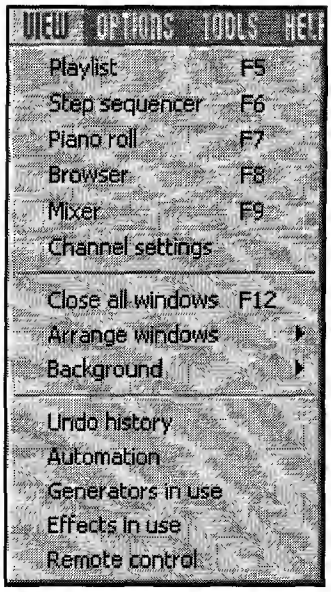
TIP: To see newly installed plugins, click '**Refresh**' in the bottom of the '**Select plugin**' window and select **Fast Scan** rather than Scan & Verify as the latter option opens each plugin and then closes it. If there are buggy 3rd party plugins in your VST directory they may crash FL Studio. Why is it there then? Technical support will tell you when to click it, so HANDS OFF! ☺. You can change the folder where FL Studio looks for your VSTi plugins in the File Settings Dialog (page 270).

- ***Clone Selected*** - Insert a clone of each selected channel in the Step Sequencer right after it. The clone retains the generator type of the original, as well as all of its settings, but does not contain its notes and events.
- ***Delete Selected*** - Removes all selected channels in the Step Sequencer.
- ***Move Selected Up*** (Alt+Up) - Moves all selected channels one step up in the Step Sequencer.
- ***Move Selected Down*** (Alt+Down) - Moves all selected channels one step down in the Step Sequencer.
- ***Group Selected*** (Alt+Z) - Adds all selected channels to a group (a popup window displays to enter the name of the group). If a group with the name you specified doesn't exist, it will be created automatically. For more information on channel grouping see the Channel Filtering section in the Step Sequencer page.
- ***Zip Selected*** (Alt+Z) - Turns all selected channels in the Step Sequencer into compact view mode (shown at the bottom of this picture). Right-click the button of a zipped channel to unzip it.



- ***Unzip All*** (Alt+U) - Unzips all channels in the Step Sequencer.

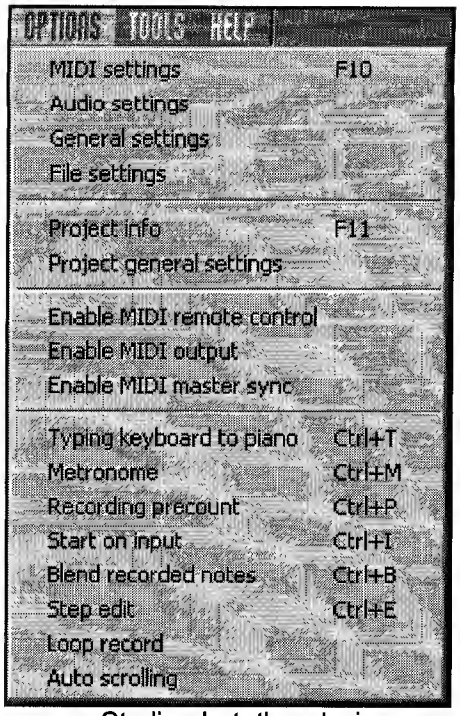
View Menu



The View menu contains commands for showing/hiding and arranging FL Studio windows. We strongly recommend you learn the keyboard shortcuts (shown in brackets) as these features are key to efficient use of FL Studio.

- ***Playlist*** *(F5)* - Shows/hides the Playlist window.
- ***Step Sequencer*** *(F6)* - Shows/hides the Step Sequencer window.
- ***Piano Roll*** *(F7)* - Shows/hides the Piano Roll window.
- ***Browser*** *(F8)* - Shows/hides the Browser window.
- ***Effects*** *(F9)* - Shows/hides the Mixer window.
- ***Channel Settings*** - Shows/hides the Channel Settings window.
- ***Close All Windows*** - Closes all windows in FL Studio.
- ***Arrange Windows*** *(Shift+Ctrl+H)* – Arranges all windows so they fit on the screen.
- ***Background*** – Allows you to select various images for the FL desktop. You can import your own images.
- ***Undo History*** - Expands the history section in the Project Browser.
- ***Automation*** - Expands the automation section in the Project Browser.
- ***Generators in Use*** - Expands the generators section in the Project Browser.
- ***Effects in Use*** - Expands the effects section in the Project Browser.
- ***Remote Control*** - Expands the remote control section in the Project Browser.

Options Menu



The Options menu contains commands that set various options in FL Studio. This is a powerful tool in the efficient set-up and running of the program.

- ***MIDI Settings***- (F10) - Shows/hides the MIDI Settings window.
- ***Audio Settings*** - Shows/hides the Audio Settings window.
- ***General Settings*** - Shows/hides the General Settings window.
- ***File Settings*** - Shows/hides the File Settings window.
- ***Project Info*** (F11) - Shows/hides the Project Info window.
- ***Project Settings*** - Shows/hides the Project Settings window.
- ***Enable MIDI Remote Control*** - When not checked, you will not be able to use MIDI remote control in FL Studio, but the device you use for remote control will be released for use in other applications you run simultaneously with FL Studio.
- ***Enable MIDI Output*** - When not checked, you will not be able to use MIDI output in FL Studio, but the device you use for output will be released for use in other applications you run simultaneously with FL Studio.
- ***Enable MIDI Master Sync*** - If checked, FL Studio will sync (as a master) with an external MIDI device or a sequencer. You can choose a device to sync with in the MIDI Settings window.
- ***Typing Keyboard to Piano*** (Ctrl+T) - When turned on, you can use your typing keyboard to record notes as you would do with a real MIDI keyboard (see page 325).
- ***Metronome*** (Ctrl+M) - When turned on, you will hear a short 'metronome' sound in the beginning of each beat with an accent at the beginning of each bar. It is especially useful when you need to keep yourself 'synced' with song tempo when recording a melody from a MIDI keyboard.

TIP: Make sure **Enable MIDI output** and **Master Sync** are off when not in use as both place an additional load on the CPU.

- ***Recording Precount*** - (Ctrl+P) - When turned on, you will hear countdown metronome ticks before the start of a recording session.
- ***Start on Input*** -(Ctrl+I) - When turned on, pressing the play button will set FL Studio in waiting mode and actual playing/recording begins at the moment input data is received (for example, when key is pressed on the MIDI keyboard).
- ***Blend Recorded Notes*** -(Ctrl+B) - When turned on, the notes you record will blend with any already existing ones, otherwise recorded notes will overwrite the old ones.
- ***Step Recording*** -(Ctrl+E) - Switches step recording on and off.

Tools Menu

The Tools menu contains useful tools for working with channels, patterns an effects, and gives you the ability to use external application as tools in FL Studio.

TIP: Some of the checkboxes in the menu-bar have popups. To set the middle note of the kb to piano, to set the length of the recording precount, the metronome sound, the wait for input mode.

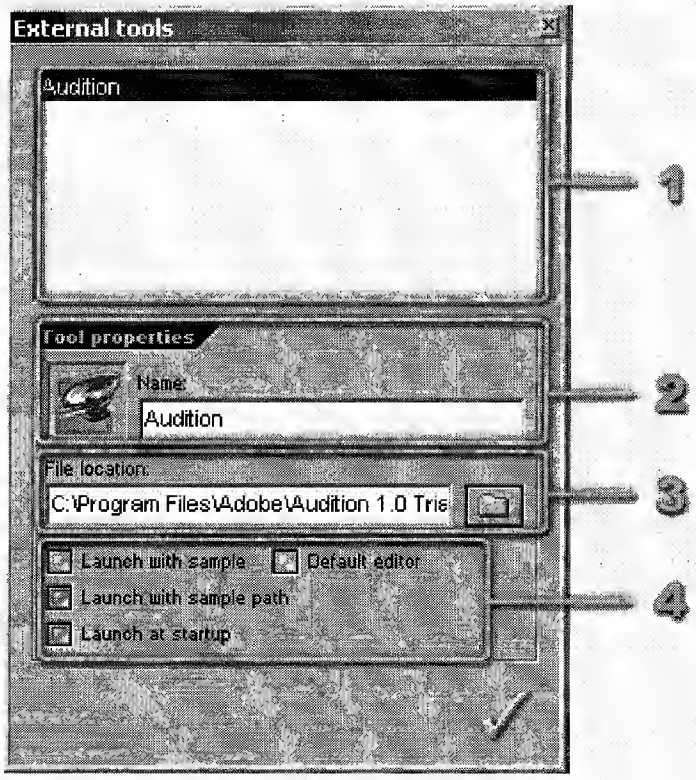
Misc Macros:

- ***Switch Smart Disable for all Effects*** - Turns on Smart Disable for all effects (see Mixer window).
- ***Color Selected Channels*** - Colors all selected channel buttons in the Step Sequencer. You will be asked for start and end color (for gradient coloring).
- ***Select All Unused Channels*** - Selects all channels that do not contain any notes (neither in the Step Sequencer or the Piano Roll) in any pattern.
- ***Go To Next Empty Pattern*** (F4) - Switches to the next pattern that does not contain any note or automation events (either in the Step Sequencer or the Piano Roll) in any channel.
- ***Add External Tools*** - Opens the External Tools dialog that lets you set external applications.

TIP: You can set your favorite wave editor as a default tool in FL Studio using the **External Tools** menu.

External Tools

Contains a list of tools you have set using the External Tools dialog. The External Tools dialog allows you set up external applications (wave editors, sample browsers etc.) for use as tools in FL Studio.



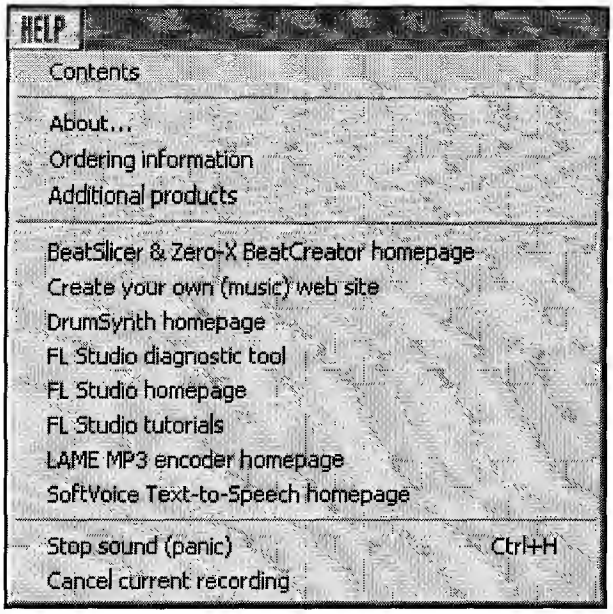
1) **Tools List** - Displays a list of all configured tools. Before setting up a new tool click an empty field in the list, otherwise the new tool will overwrite an existing one. It is also possible to drag the entries up and down to change tool order.

2) **Tool Properties** - Displays the program icon of the application and enables setting of the displayed name of the tool in Tools menu.

3) **File Location** - Enter the full path to the external application to be used as a tool. Alternatively, click the button on the right to browse the application.

4) **Tool Type** - Sets the launching option for the tool. **Launch with sample** option is suitable for wave editors, and when enabled with the **Default editor** button, this external tool will replace the default Wave Editor in FL Studio. **Launch with Sample Path** is useful for batch audio processing applications and external sample browsers. **Launch at Startup** can be used to automatically launch a software synthesizer to be controlled from FL Studio, for example. Any tool that you define as 'launch with sample' will appear in the channel settings options menu, the popup on the sample view in that same window, and the popup on wav items in the browser.

Help Menu

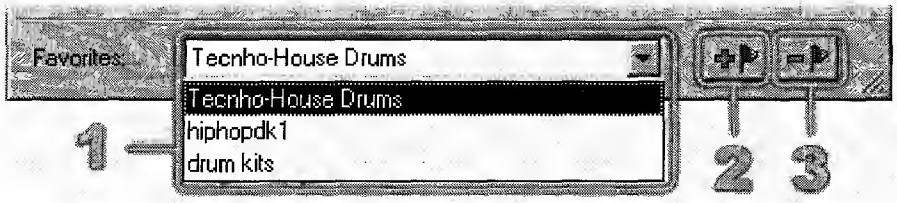


The Help menu (F1) contains commands for access to the online reference system and other help documents. It also contains some useful commands related to working in FL Studio.

- ***About*** - Shows the About box of FL Studio. Check here to see what version number you are using and program credits.
- ***Stop Sound*** *(Panic)* *(Ctrl+H)* - Silences audio and MIDI. Notice that this function works by setting all notes to release state, so if the envelope release is not short, sounds may not stop immediately.
- ***Cancel Current Recording*** - Use this command to stop your current recording session without saving notes and events to the project. This command works only while recording. If you want to delete recorded notes and events after recording has stopped, use the **Undo** feature instead.

Favorites Section

All open/import and save/export dialogs in FL Studio have been enhanced with a 'Favorites section', which you can use to quickly transfer to frequently used folders. To set, browse to the directory you want and then press the **+** button, the directory will then appear in the drop-down (1).



1. **Favorites Combo Box** - Contains a list with shortcuts to all favorite folders you have set.

2. **Set As Favorite** - Adds the current folder to the favorites.

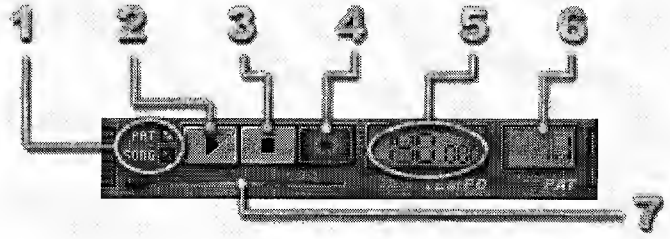
3. **Remove From Favorites** - Removes the currently displayed folder in the combo box from the favorites list.

Menu Bar Panels

As we have seen in the previous section, **FL Studio panels** are located at the top of the screen, and provide quick access to many important commands and options. The panels behave much like standard Windows toolbar controls, however they can be reordered in any way, and docked to the top or bottom of the screen by dragging a special handle located in the left side of each panel (the appearance of this handle may change with FL Studio versions). If you right-click the empty area at the top of the screen, a menu will pop up that contains a list of all panels. Those that are visible are preceded by a check mark. You can use this menu to toggle the visibility of the individual panels in FL Studio, except the main panel (which always remains visible). Checking 'Lock' will lock the panels into position so you don't move them by accident.

Transport Panel

The Transport panel contains controls for playing, recording, and setting song position and tempo.



1) ***Pattern/Song Mode*** (L) - Switches between pattern and song mode. In pattern mode, only the current pattern is played, while in song mode the whole sequence in the Playlist is played.

*2)****Play/Pause*** (Space) - Plays/pauses the song/pattern, how surprising ☺. **In 'Record' mode** this stops the recording process in the same way the Stop button does, so be careful.

3) ***Stop*** (Space) - Stops recording/playing.

4) ***Record*** (R) - Switches between record and play mode.

NOTE: The 'Record' function captures MIDI input, USB input, FireWire input, knobs, sliders and audio, depending on what modes are selected, and what data is coming into FL Studio.

5) ***Tempo*** - Contains the song tempo, including fine tempo controls. There are a few things hidden under this little display, so pay attention ☺

- ***Song Tempo*** *(bigger digits are beats per minute, smaller digits are 0.001 bpm units)* - Shows/sets song tempo. Right-click the LCD screen for some tempo presets & commands:

- ***Tap*** - Click the tap command and you'll see the tempo time window appear . Click the tap icon (now where did Image-Line get the idea for that graphic from? ☺) repeatedly with the desired tempo in mind. You will see the tempo adjust to new values after 2-3 taps. For best results, tap at least 10-16 times until the tempo is stabilized. Clicking the OK button accepts the new tempo. TIP: You can 'tap tempo' with your project playing or stopped.

- ***80bpm-160bpm*** - Some useful tempo presets.

TIP: Change your starting tempo from time to time. The default tempo for FL is 140 bpm. See if you can get inspired at 60 or 190 bpm.

- ***Twice Slower*** - Plays the song at half speed. This option does not set the tempo of the song at half speed (so the value displayed in the LCD won't change). This is a temporary state to make it easier for the user to record notes/events. After recording, this option may be turned off to return to the original tempo.

The rest of the commands match the standard commands for an automatable control.

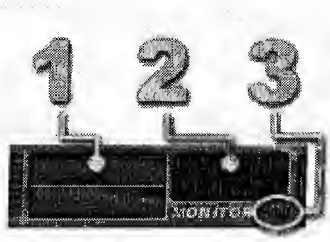
- ***Tempo Fine Tune*** *(smaller digits)* - This control lets you fine tune the tempo of the current project in measure of 1/1000 bpm. The value set here will be added to the base tempo.

NOTE: It's not recommended to use decimal settings when starting a new song, use a whole number for your tempo. However, decimals can be used to match the exact speed of another song to be mixed in an FL Studio project (for making/using existing sampled loops, 'cover songs' etc.).

6) Pattern Selector (+ /for next pattern/; - /for previous pattern/) - Shows/sets the current pattern. You can have up to 999 patterns.

7) ***Song Position Slider*** - Shows/sets the current song position.

Output Monitor Panel



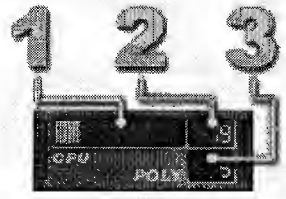
The Output Monitor panel contains controls for monitoring the audio output of FL Studio.

1) ***Oscilloscope*** - Oscilloscope view displays the wave output of FL Studio. Right-click the Oscilloscope view to set various options for its look. This is a great way to get a feel for what various synthesizer wave-forms look like. Play up and down the note scale until the image stabilizes.

2) ***Peak Meter*** - Displays the relative loudness of the final wave output from FL Studio. Red indicates clipping, where the audio output reaches a maximum level. Clipping squashes the peaks of the sound waves producing a distorted sound if rendered to WAV or MP3 in this state. Brief flashes of red, are OK, but if the peak meter is leaving a warm red glow on the wall behind you, turn down the master channel in the mixer! See page 181 for more information on setting levels in FL Studio.

3) ***Monitor Switch*** - Switches oscilloscope and peak meter views on and off. That's there so you can hide all the clipping in your mix when someone important comes to see the producer genius (that's you) working ☺

CPU Panel



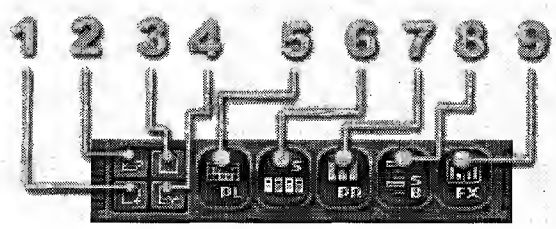
The CPU panel displays the CPU usage and polyphony of the project.

1) ***CPU Meter*** - The CPU bar meter shows how much of the CPU is used for playing the current project. Left-click the view to make it refresh more frequently (clicking again will turn it back to normal refresh frequency).

2) ***CPU Meter*** *%* - Shows the CPU usage in percent. If the meter rises above 80% don't be surprised if you experience a few pops and crackles. Some ways to reduce CPU overhead are to increase the audio buffer setting (press **F10** and click audio-settings), reduce the number of voices using poly limit on channel settings or render mixer tracks to audio and use them as audio-clips, remembering to disable the original live channels once the new audio clip is imported (see page 267 for more detail on CPU saving techniques).

3) ***Polyphony*** - Shows the amount of voices being mixed at the same time. Note: TS404 channels are not counted when displaying the polyphony.

Shortcut Panel



The Shortcut panel provides shortcuts for some frequently used commands. This panel, and the associated keyboard shortcuts are your friends - get to know them well ☺

1) ***Save Project As*** (Ctrl+Shift+S) - Acts like the 'Save As' command in the File menu.

2) ***Open Project*** (Ctrl+O) - Acts like the 'Open' command in the File menu.

3) ***Save Project*** (Ctrl+S) - Acts like the 'Save' command in the File menu.

4) ***Export to Wave File*** (Ctrl+R) - Acts like the 'Export Wave' command in the File menu.

5) ***Playlist*** (F5) - Shows/hides the Playlist window.

6) ***Step Sequencer*** (F6) - Shows/hides the Step Sequencer window.

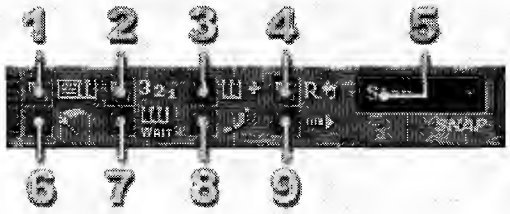
7) ***Piano Roll*** (F7) - Shows/hides the Piano Roll window.

8) ***Browser*** (F8) - Shows/hides the Browser window.

9) ***Mixer Window*** (F9) - Shows/hides the Mixer window.

Recording Panel

The Recording panel sets some recording related options and contains the global snap selector.



1) ***Typing Keyboard to Piano*** (Ctrl+T) - When turned on, you can use your typing keyboard to record notes as you would do with a real MIDI keyboard. Right-click the LED to select the base octave for mapping the keyboard keys. Stop being such a scrooge and buy a MIDI controller keyboard, you will look 1000% cooler, trust us ☺

2) ***Recording Countdown*** (Ctrl+P) - When selected, you will hear countdown metronome ticks before the start of a recording session. Right-click the LED to select the number of bars to countdown.

3) ***Blend Recorded Notes*** (Ctrl+B) - When selected, the notes you record will blend with any already existing ones, otherwise recorded notes will overwrite the old ones.

4) ***Loop Record / Overdub*** - Enable this option to loop the recorded pattern indefinitely until stop is hit. If a there is a time selection in the Piano Roll that selection will be looped instead. This feature allows you to 'overdub' content on each loop.

TIP: Use this feature and switch between channels as the project is looping in order to record scores individually in each channel you plan to use in a pattern.

5) ***Global Snap Selector*** - This control sets the global snap value that is used in the Piano Roll, the Event Editor and the Playlist. When you choose Auto, snap will conform to the zoom level you set in each of the windows. You can also right-click the selector to select the default note length from the menu that appears (used when drawing notes in the Piano Roll).

6) ***Metronome*** (Ctrl+M) - When selected, you will hear a short 'metronome' sound in the beginning of each beat with an accent at the beginning of each bar. It is especially useful when you need to play in time with song tempo while recording a melody from a MIDI keyboard. Right-click the LED to select a different metronome sound.

7) ***Start on Input*** (Ctrl+I) - When selected, pressing the play button will set FL Studio in waiting mode. Playing/recording begins at the moment input data is received (for example, when key is pressed on the MIDI keyboard). Right-click the LED to select if you want this option when playing or recording only.

8) ***Step Recording*** (Ctrl+E) - Switches step recording on and off, see 34.

9) ***Auto Scroll*** – Selecting this option enables auto scroll in the Step Sequencer, Playlist and Piano Roll, when the time markers (playing position) go outside of the window.

NOTE: If you make a change while FL Studio is playing, the Play List/Piano Roll, **auto scroll** will automatically disengage to allow you to edit the section without the screen scrolling it away.

Time Panel

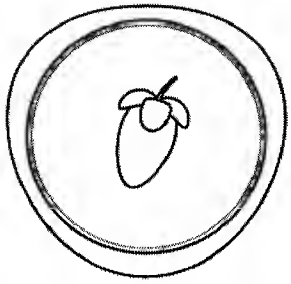
The Time panel displays the song time in various formats (bars, minutes).

1) ***Step/Beat switch*** *(S/B)* - This switch selects whether the time is displayed in steps (S) or beats (B). This option applies to bar display mode only, see the next option.

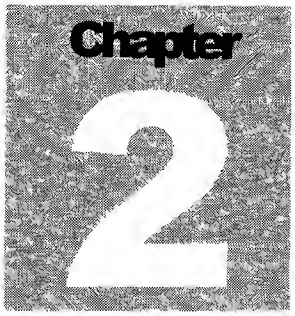
2) ***Bar/Minute Mode switch*** - This switch selects whether the time is displayed in BARS:BEATS/STEPS:TICKS format (B) or MINUTE:SECOND:1/100 SECOND format (M).

3) ***Time Display*** - Shows the song time in format according to the settings.

TIP: 98.7% of all No1. songs are less than 3 minutes 30 seconds, and in 4/4 time.

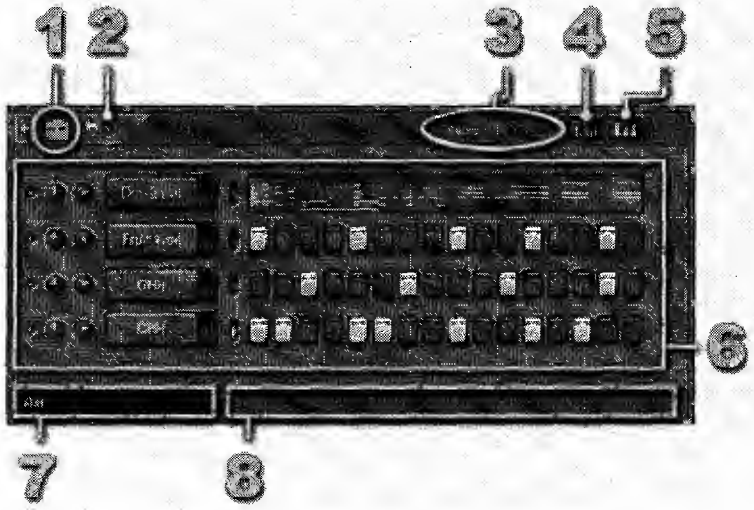


'It is only the first step that is difficult.'
Marie De Vichy-Chaconne



The Step Sequencer

The Step Sequencer in an important tool for the composition process in FL Studio. It contains a button for each **instrument channel** in the project. Channels are independent sound generators, from which you can call Channels Settings or the **Piano Roll**. The **Step Sequencer** default is a grid pattern sequencer ideal for creating drum loops and simple melodies. Generally, however, the step sequencer is best for triggering percussion samples while the Piano Roll is best for serious melodic composition (see page 42).



1) ***Pattern Length*** *(Number of Beats)* - Sets the number of beats for the current pattern. If you leave this value undefined: '--', the pattern obeys the global value for the project. You can change the global value and the beat length in the Options>Project General Settings window.

2) ***Repeat Step Sequencer*** - If this option is checked, the grid sequence will repeat itself throughout the pattern if it contains automation or Piano Roll sequence data longer than the pattern (otherwise these settings have no effect).

3) ***Swing*** - Slide it to right to add 'swing' to the notes you write in the Step Sequencer. Swing offsets the timing of every second step by an amount equal to the position of the slider, right = more. It's cool, use it! ☺.

4) ***Graph Editor Button*** *(F8 G)* - Shows/hides the Graph Editor. This feature allows you to graphically change values such as Pan and Velocity for example.

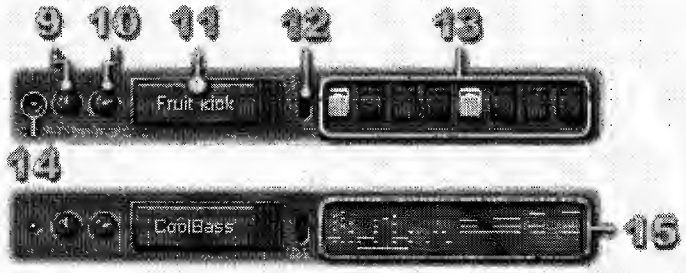
5) ***Keyboard Editor*** *(F8 K)* - Shows/hides the Keyboard Editor. Note: only while the K key is held.

6) ***Channels Area*** - Contains the channels and the pattern/piano roll grid.

7) ***Channel Display filter*** *(F8 Page Down for next group; Page Up for previous group)*- Here you can set the groups of channels to show in the Step Sequencer (read the Channel Filtering paragraph below for more information). This is a great way of grouping percussion and melody channels, for example.

8) ***Playing Step LEDs*** - These LEDs will show the current playing step in the pattern.

9) ***Channel Panning Knob*** - Use this Knob to set channel's panning. Don't forget it's automatable to good effect!



10) ***Channel Volume Knob*** - Use this Knob to set channel's volume. This is automatable.

11) ***Channel Settings Button*** – Clicking on this displays the channel name & shows/hides the Channel Settings panel, where you can control many features affecting the channel sound.

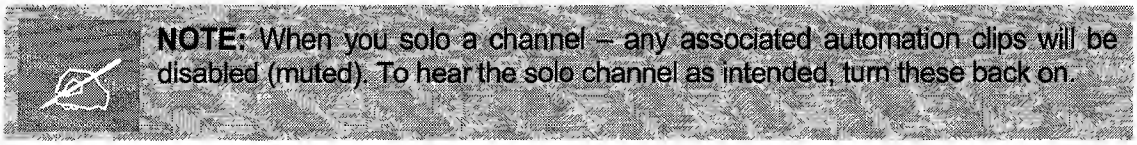
NOTE: The channel default volume is 78%. This is to minimize clipping when multiple channels are playing simultaneously. Audio clips are set to a default channel volume of 100%. Remember these are only defaults so you can set them to any value you like.

12) ***Channel Selector*** - When this LED is turned on, the channel is considered selected (used in cut, copy etc. operations - see Edit menu).

TIP: Holding down the ALT+ Up/Down arrow keys will move the position of the channel in the window - very useful for grouping 'similar' generators. Clicking a selected channel selector will select all channels. Dragging across channel selectors allows you to select multiple channels at the same time. Right clicking allows you to select multiple channels one by one.

13) ***Sequence Steps*** - Each step represents a 16th note in the pattern. Turn the steps on (left mouse click) and off (right mouse click) to create the desired pattern.

14) ***Mute switch*** *(⌨ 0-9 to mute/unmute; Ctrl+0-9 to solo/unmute all)* - Turning this LED off will mute the channel. Clicking it again unmutes it. You can also quickly solo a channel - right-click the LED and from the popup menu, select Solo. Repeat that action to unsolo the channel (unmute all).


NOTE: When you solo a channel – any associated automation clips will be disabled (muted). To hear the solo channel as intended, turn these back on.

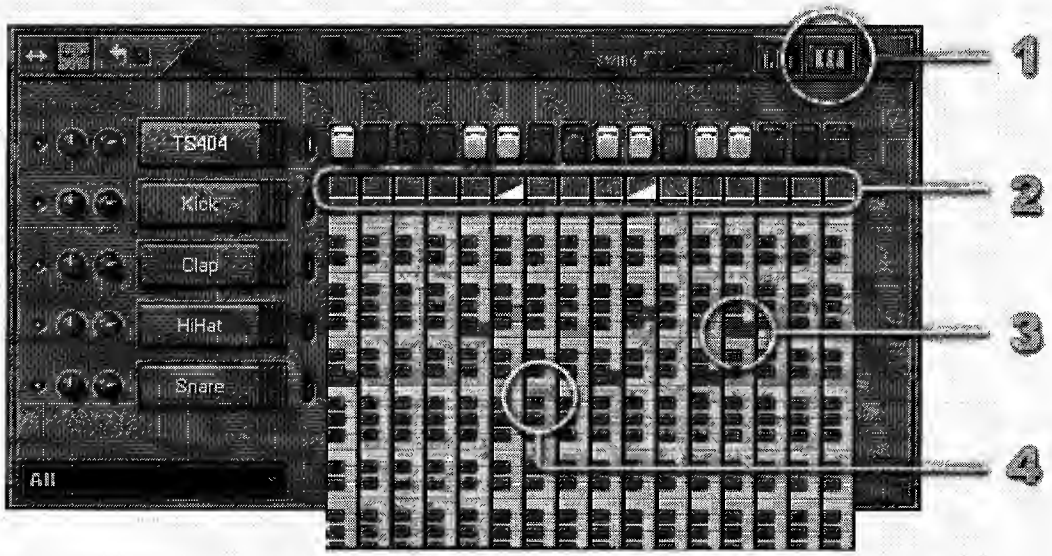
15) ***Piano Roll Preview***- If you don't have active steps in the current pattern and you do have notes in the Piano Roll, the steps are replaced by a preview of the Piano Roll. With the preview available you are aware of how your pattern looks without opening the Piano Roll view each time. However, you cannot edit notes in this preview. Click it once to show/hide the real Piano Roll window. The lighter and darker blocks in the preview mark the number of bars contained in the Piano Roll sequence (each block is a bar).

Channel Filtering

As projects grow in size and the number of channels increases, finding the right one can be tedious. To optimize workflow, combine several channels in a group and set the Step Sequencer to display only that specific group of channels (for example percussion group or lead synth group). To decide which channels should be visible you can use the Channel Display Filter control (7). Left-click to open the channel filter menu. Selecting 'All' shows all channels at once, no matter if they are part of any group or unassigned. Selecting 'Unsorted' displays only the unassigned channels. Also, if you have made any channel groups, you can select them for display from this menu. To add an empty group, right-click and select Add Filter Group. With the group displayed, right-click the Channel Display Filter control to see commands for renaming and deleting a group (deleting a group won't delete the channels in it, but make them unassigned). To add all selected channels to a group, use the Group Selected command from the Channels menu.

Keyboard Editor

The Keyboard Editor enables setting of note pitch in the Step Sequencer. It is a group of piano keyboards (each of them rotated 90 degrees counter clockwise) - one for each step in the Step Sequencer. Actions you perform in the Keyboard Editor affect ALL selected channels.



1) ***Keyboard Editor button(*** *K)* - Shows/hides the Keyboard Editor.

2) **Slide/Portamento Line** - Used to apply a slide/portamento effect to the notes in the Step Sequencer. Note that although this line appears for all generators, some of them might not support the portamento feature (the VSTi and DXi instruments and some Fruity Plugin generators do NOT support portamento). Left-click to set slide/portamento on, right-click to set it off.

3) ***Active Note*** - This (orange) button shows that the step it belongs to is active, and also shows its pitch. Left-click to set another pitch for the step (also if it was turned off, this makes the step active).

4) ***Inactive Note*** - This light orange button shows the step is inactive. Right-click to set another pitch for the step (also if it was turned on, this makes the step inactive). Inactive notes are not used by the generators, they are just notification of the default note pitch used when activating the step.

Graph Editor

The Graph Editor allows additional properties of notes to be edited in the Step Sequencer. You can set each note's panning (Pan), velocity/volume (Velocity), cutoff (Filter cut), resonance (Filter res), pitch (Pitch) and shifting (Shift). Shifting creates delay between the timing of a note event and the time it is actually triggered. 100% shift means one 16th time delay. Pitch sets note pitch, but is really intended for use with drum channels and effects. If you want to enter a melody, use the Keyboard Editor or Piano roll instead.

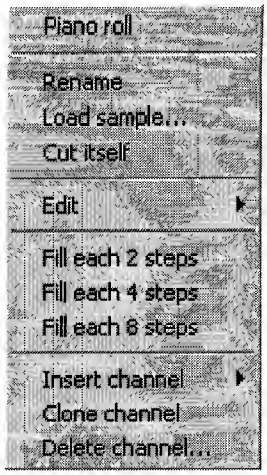
1) ***Graph Editor button*** *(F G)* - Shows/hides the Graph Editor view.

2) ***Property Selector slider*** – Selects which property is edited. With all generators it is possible to set panning, velocity, filter cutoff, resonance, pitch and timing. However, some external generators may not support all those properties (for instance, a mono generator may ignore the panning property). **To change**, left-click a column and drag up/down to adjust the property. You can drag **all values simultaneously** - hold Ctrl and adjust one, the others will follow. You can also **create 'lines'** with values in the **Graph Editor** - right-click a value and drag to another, FL Studio will automatically interpolate the in-between values.

NOTE: While it is possible to set all step, panning and velocity values in the Editor, only those corresponding to activated steps/notes will be heard. In the example above, the velocity setting for steps 4, 7, 8, 9, 11, 14 and 16 are redundant since the steps corresponding to these are not active.

Channel Menu

To activate - right click on a channel generator/instrument button.

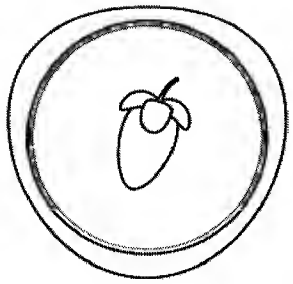


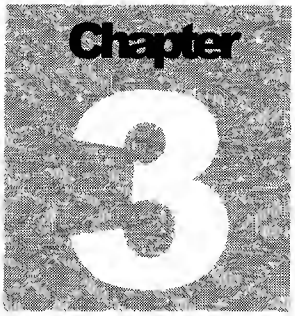
- ***Send to Piano Roll*** - Converts any active steps to Piano Roll notes and opens the Piano Roll view. *Appears only when there are active dots for the channel.*
- ***Piano Roll*** - Shows/hides the Piano Roll view. *Appears only when there aren't any active steps in the Step Sequencer.*
- ***Rename*** – Renames the channel. This is also the place where the channel color is changed.
- ***Load Sample*** - Appears in Sampler channels only. This command opens a dialog where you can select a sample to fill the sample bank of a Sampler.
- ***Cut Itself*** - Checking this option makes each active note cut the previous one. What actually happens is FL Studio assigns a unique value in both Cut and Cut By fields in the Miscellaneous Channel Settings.
- ***Edit*** - Contains a submenu that wraps some commands from the main Edit menu.
- ***Fill Each 2 steps*** - Turns on 1st, 3rd 5th etc. dots in Step Sequencer's pattern grid. All other dots are turned off.
- ***Fill Each 4 steps*** - Turns on 1st, 5th, 9th etc. dots in Step Sequencer's pattern grid. All other dots are turned off.
- ***Fill Each 8 steps*** - Turns on 1st, 9th, 17th etc. dots in Step Sequencer's pattern grid. All other dots are turned off.
- ***Insert Channel*** - Contains a list of all generators selected as favorites. Choosing a generator from this menu will add a single instance of it below the current one. Click More... to open the Select plugin window, which contains a list of all generators present in FL Studio (including VSTi and DXi). Double-click a generator name to add an instance of it in the Step Sequencer. Click the check box preceding each name to mark it as a favorite (all plugins preceded by a check mark will appear in the favorites list). TS404 and Sampler are internal for FL Studio, so they always appear in the Favorites list (and not in the Select plugin list).

- ***Clone Channel*** - Inserts a copy of the channel below the selected channel. The clone retains the generator type and settings of the original but does not contain the events and the notes. You can copy these if you wish with the Ctrl+C then Ctrl+V shortcut key commands.

- ***Delete Channel*** - Removes the channel.

TIP: You can remove multiple channels by selecting a group of them with the right mouse button. Selecting can be faster if you Right click on an LED and then drag across a group of channel selector LEDs. All LEDs the mouse passes over will then be selected/deselected, depending on the initial action.

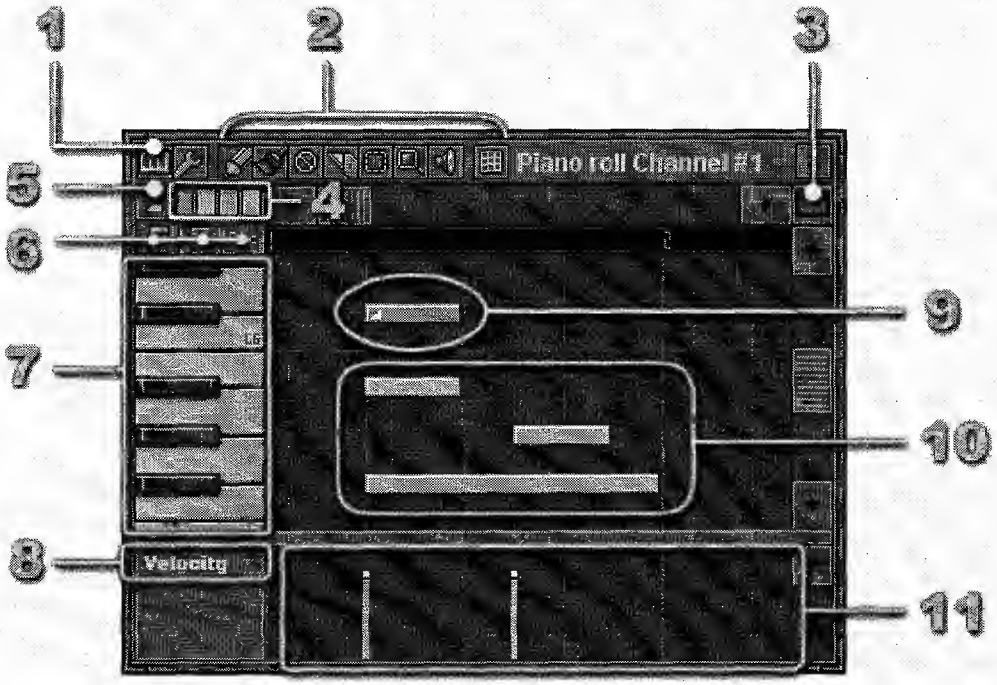




'Life is like a piano... what you get out of it depends on how you play it.'
Unknown

The Piano Roll

The Piano Roll in FL Studio is one of the most powerful available in any software studio. It also contains a number of tools allowing complex manipulations of the notes with ease. The Piano Roll represents note pitch on the vertical axis and time on the horizontal axis (it's the same principle as the original paper 'piano rolls' used to automate mechanical pianos in the past). The resolution of the grid is user-selectable (zoomable) and allows you to construct songs with unlimited complexity. The Piano Roll is also the place where 'live' MIDI playing is recorded for playback and post-editing.



*1) **Piano Roll Menu Button.*** Main menu button . The spanner provides quick access to the most commonly used tools.

*2) **Toolbar**:* Draw (P); Paint (B); Erase (D); Cut (C); Select (E); Zoom to selection (I); Playback (Scrub) (I); Local Snap.

*3) **Time** (Horizontal) Zoom.* Use this in combination with the Local Snap to enable finer changes to the note timing.

*4) **Color Group Selector**.* Use this mode to create independently editable groups of notes within the same piano roll. Also perfect for independent sliding.

*5) **Slide Toggle** (S).* Select this and any note entered will be a slide event until it is deselected.

*6) **Display Mode** (M):* Keyboard; Mini Keyboard; Text (Drum Names, Slice names etc.);

*7) **Preview Keyboard*** Click on the keyboard to preview notes. This does not work when play is active.

*8) **Property/Event Selector**:* This drop down menu allows you to select the note property to edit.

*9) **Slide Event**:* Note the triangle at the beginning of the note (ramp symbol).

*10) **Note Events**:* 'Notes' for short ☺. Vertical position is pitch. Length is duration.

*11) **Integrated Event Editor**:* Controls pan, note velocity, filters etc.

Piano Roll Operations

Notes in Piano Roll are displayed as horizontal bars (10) and slides are shown as horizontal bars with a small triangle drawn in the left side (9). You can preview notes by left-clicking the Preview Keyboard keys (7). Pitch is mapped from low (bottom) to high (top). The horizontal dimension represents time, and each number in the Piano Roll ruler represents a single bar.

TIPS: Change - Click the channel name in the title bar to select another channel to display in the Piano Roll. **Stretch** - Select a group of notes, position the mouse over the trailing edge of one note in the group so the double-arrow appears, hold down the SHIFT key, left-click and move your mouse. This will change the timing and length of the note group. To **lengthen** the note group simply left-click after seeing the double arrow and move without pressing SHIFT.

Operating with Notes

Each note in the Piano Roll has its own settings. Double left-clicking on the note will bring up the note properties box (page 47). There are a number of ways to manipulate notes manually in the piano roll:

- Draw mode allows you to draw, edit and delete notes.
- Paint mode is similar, but allows you to draw multiple notes at once while dragging horizontally in the Piano Roll.

In draw or paint mode, left-click in the Piano Roll's grid to draw a note. After that, you can drag its left side to move it vertically and horizontally. Dragging its right side horizontally changes **note length**. You can right-click a note to erase it.

Select several notes with the **select tool**. This allows you to move and resize groups of notes. Alternatively, press and hold the Ctrl key and either click a note to select it, or drag a rectangle to select all notes in the enclosed area. Hold Ctrl and Shift together while selecting to add notes to the existing selection. To **deselect individual notes**, hold Ctrl and click a note from the selection.

Deselect notes by right-clicking an empty space in Piano Roll's grid. Instead You can also switch Piano Roll to select mode by clicking the select mode button.

To **time stretch** (lengthen) an entire group of notes, select the group, hold SHIFT and drag the right edge of any note in the selection.

You can also Ctrl+click or double-click the time ruler and drag along it to **select all notes in a specified time range**, or Ctrl+click the Preview Keyboard (7, see picture) to **select a range of notes with the same pitch**.

A quick way to **clone notes** in the current selection is to drag with the SHIFT button pressed in advance.

Draw complete chords automatically, instead of single notes, by right-clicking the draw mode button (2) and from the menu select a chord type. Now, when you draw in the Piano Roll, FL Studio automatically creates a chord. To draw single notes again, right-click the draw mode button and select None (Shift+N).

The **Cut tool** allows you to **split one or more notes** in the manner you wish. To use the cut tool, make sure you're in cut mode (the Cut button is pressed), left-click in the grid area and drag to define the 'cut line' direction and length. Release the mouse button to split all notes at their intersection point with the cut line.

The **Playback tool** enables you to preview the current sequence by dragging horizontally in the piano roll (thus enabling you to define the playback speed and order). Alternatively, hold ALT key while in draw mode.

The **Local snap** tool allows you to independently select **snap** values (quantizing) different to the global snap value. This is especially useful when you are using different snap values in the piano roll and Playlist.

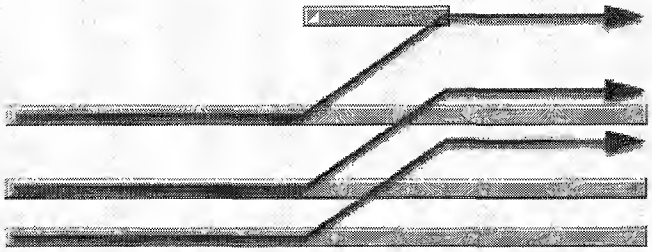
Understanding Slides

To make a group of notes slide gradually from one pitch to another you can draw special slide events, these specify to FL Studio how notes should be slid. Slides look similar to note events, but they have a small white triangle drawn in their left side (9). To draw slides, click the slide toggle button (5). Clicking it again will switch back to note events. When you draw a slide event, FL Studio will start sliding existing notes towards the pitch at the start of the slide event and will reach the desired pitch at the end of the slide. In this way, by changing the slide marker length you can control the speed of the slide. If several notes are slid simultaneously, the topmost is taken as a reference for the pitch offset (see picture, next page). At the end of the slide event, all notes are slid, so the topmost note has the pitch of the slide event. After the slide event ends, notes still remain offset from their original pitch. Slides do NOT produce a sound themselves (although they preview when created/moved). Instead they make existing notes slide.

NOTE: Slides only work for native FL Studio plugins. Due to the way VSTi and DXi plugins work (it's a limitation of the VSTi and DXi design standard), it's impossible to slide the notes of these plugins. To achieve slides for VSTi and DXi plugins you can automate the pitch-bend knob in the channel settings.

Slide Color Groups

The following image shows how pitch changes with the slide event. Note that the slide events have all the usual properties of a note - velocity (note volume), panning, cutoff and resonance, so during pitch sliding, it also 'slides' all properties from those of the playing notes to those of the slide.



You can draw notes and slides in four colors - green, cyan, pink and yellow. The color you use does not make a difference to a note's sound. Color grouping is used to independently slide several notes simultaneously in the same piano roll. The slides will apply only to notes that have the same color. For example, yellow slide will bend the pitch of yellow notes, but will ignore green notes. This way, you can have up to four notes sliding simultaneously in different directions (one for each color group). To select the current drawing color, click the appropriate button on the color group selector (5).

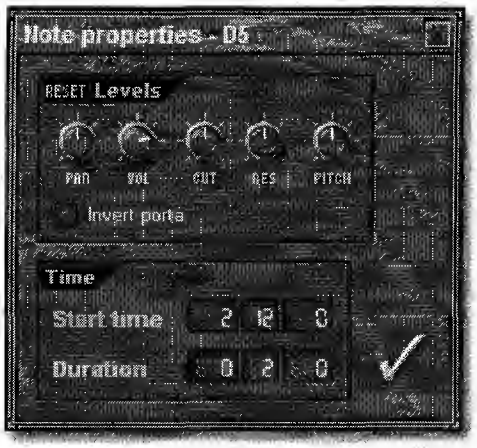
Slide color groups are also used with the Mono mode in the polyphony settings (see Miscellaneous Channel Settings). Mono mode applies to each color group separately. So using all four colors can result in a polyphony of up to 4 voices at once.

Integrated Event Editor

The Piano Roll includes an integrated event editor (11), allowing convenient editing of channel volume, panning and pitch (inside the Piano Roll). However, the event editor in Piano Roll has one extension - you can also edit note properties. Note properties behave similar to the normal events, and are displayed in the event editor as lines with a small square at the top. Using this extension you can edit note velocity (local note volume), panning, cutoff and resonance. These are exactly the same properties you can edit using the Graph Editor if you were entering notes in the Step Sequencer. Since note properties are part of the actual note, you cannot move, delete or interpolate them. When you move a note horizontally (thus changing its start position), its properties also move with it. To choose what property or event type to edit, click the property/event selector (8) and choose property/event type from the menu that appears.

NOTE: When several notes start at the same time you can not set the properties of each individual note (they are all set at once). To solve this issue, first select the notes you want to modify - editing this way alters only the properties of the selected notes. Another solution is to use the Note Properties Box (explained below).

Note Properties Box



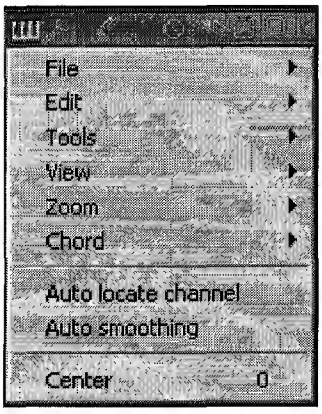
The **Note Properties Box** is another way to set note properties when you want to individually edit note values for overlapping note value bars in the event editor window. Double-click a note to display the properties box.

1. ***Levels panel*** - Allows change to panning, velocity (note volume), cutoff and resonance. The reset button next to panel title bar resets note properties to the initial levels. Invert Porta inverts the portamento state for this note. If the global portamento (see Misc Channel Settings) for this channel is off, for this note it is on and vice versa. There is also a Piano roll menu tool – **Piano roll Scaling box,** see page 60.

NOTE: If the note you double-click is a part of a selection then the properties you set apply to all notes in that selection. The Time section is not available in that case, because the selected notes may have different lengths or start points. Also the note level control now changes level 'offsets' (acts a s a multiplier value) for all notes.

2. ***Time Section panel*** - Changes note start position and length. For each setting, there are three LCDs, for entering position length in bars:steps:ticks format.

Piano Roll Menu



This menu provides many important functions for working with the Piano Roll, such as copying and pasting notes, converting color groups etc. You can access Piano Roll's menu by clicking the Piano Roll menu button (1). For more information, see the Piano Roll menu page.

1. File

- ***Open Score*** - Lets you load notes from a FSC file in the Piano Roll.
- ***Save Score As*** - Lets you save all notes in the current Piano Roll view as a FSC file.

- ***Copy*** (⌨ Ctrl+C) - Copies all selected notes/slides to clipboard.

- ***Import MIDI*** (Ctrl+M)- Shows the Import MIDI Data dialog box, that lets you import notes from MIDI files to the Piano Roll. Selecting this command from a Piano Roll window imports only note events. To import controller data (cutoff, resonance etc.) from a MIDI file, launch the Import MIDI Data dialog box from a separate Event Editor window.

- ***Paste from MIDI clipboard*** (Shift+Ctrl+V)- Works exactly as the previous command, but uses the MIDI clipboard data rather than a MIDI file. You can paste data from any sequencer that can copy to MIDI clipboard format (e.g. Cakewalk Sonar™).

2. Edit

- **Cut** (Ctrl+X) - Cuts all selected notes/slides to clipboard.
- **Copy** (Ctrl+C) - Copies all selected notes/slides to clipboard.
- **Paste** (Ctrl+V) - Pastes notes/slides from clipboard.
- **Delete** (Del) - Deletes all selected notes/slides.
- **Delete All** (Ctrl+Del) - Deletes all notes, slides and events in the Piano Roll.
- **Select All** (Ctrl+A) - Selects all notes, slides and events in the Piano Roll.
- **Select By Color**- Selects all notes and slides that have the same color as the current one.
- **Invert Selection** - Inverts the selection.
- **Insert Space** (Ctrl+Ins) - Creates empty space that matches the current selection start and length by shifting all following notes and events forward.
- **Delete Space** (Ctrl+Del) - Erases all notes and events in the current selection and shifts back the remaining notes and events to close the gap.
- **Change Color** (Alt+C) - Repaints all selected notes/slides in the current drawing color (if nothing is selected, applies to all).
- **Insert Current Controller Value** (Ctrl+I) - Initializes the integrated event editor with the current value of the corresponding automated control. If you have selected a time slice in the graph, the current values is inserted at the beginning of the selection instead.

3. Tools

- ***Quick Legato*** - Performs a quick 'legato' to the sequence in the Piano Roll (applies only to the selection if any). This tool is a quick preset for the Articulate tool (see below).
- ***Articulate*** - Opens the Articulate tool dialog that allows you to apply staccato, portamento, legato and similar effects to the sequence in the Piano Roll (applied only to the selection if any).
- ***Quick Quantize*** (⌨ Alt+Q) - Applies basic quantize to all selected notes/slides depending on the global snap setting in the Recording panel (if nothing is selected, applies to all).
- ***Quantize*** (⌨ Ctrl+Q) - More advanced version of the quantize feature. Opens the Quantizer settings dialog.
- ***Quick Chop*** (⌨ Alt+U) - Slices long notes into many shorter, based on the global snap setting in the Recording panel (if nothing is selected, applies to all).
- ***Chop*** (⌨ Ctrl+U) - More advanced version of the chop feature. Opens the Chopper settings dialog.
- ***Arpeggiate*** - A powerful arpeggiator based on specialized score presets. See Arpeggiator for more information.
- ***Strum*** (⌨ Alt+S) - Shifts the timing and velocity of the individual notes in chords to simulate strumming (as in guitar playing and some other string instruments). See Strum settings dialog.
- ***Flam*** - Applies 'drum flam' effect to the score (applies only to the selection if any). See Flam for more info.
- ***Limit*** (⌨ Alt+K) - Limit allows you to transpose the notes of a score within a custom defined note range.
- ***Flip*** – This allows you to flip the selected score horizontally or vertically with several options for preserving note start times.
- ***Randomize*** (⌨ Alt+R) - Opens the Randomizer dialog where you can generate random note sequences based on a specific scale and/or randomize the note levels (including those of existing notes).
- ***Scale levels*** (⌨ Alt+X) - Opens the scale levels box and allows easy manipulation if the selected note levels.
- ***LFO*** (⌨ Ctrl+L) - Shows the LFO box, that lets you draw LFO-shaped events in the integrated event editor. Note that this feature is enabled only when in the property/event selector (15) a type of event is selected, instead of a note property type.

4. View

- ***Grid Color*** (Alt+G) - Opens a standard Color dialog box, where you can set a color for Piano Roll's grid.
- ***Ghost Channels*** (Alt+V) - When selected, the Piano Roll will show the scores of all channels in the current pattern (they are displayed in the background and have a semitransparent look). Note that these scores are displayed only as a reference for easier sequencing - you can not select or edit them in any way.
- ***Black Keys*** (Alt+B) - When selected, the Piano Roll grid corresponding to black piano keys becomes darker for easier orientation.

5. Zoom

Contains a submenu with a set of quick zooming levels: Far (1); Medium (2); Close (3); Best Fit (4); On Selection (5);

On Selection zooms the time line to fit the selection (the command will be disabled if no time region is selected in the timeline).

6. Chord

Shows a menu with predefined chord types. Select a chord and draw chords in the Piano Roll. Select None (Shift+N) to draw single notes again.

7. Auto Locate Channel

When selected, the Piano Roll will automatically display the first non-empty channel when switching between patterns.

8. AutoSmooth

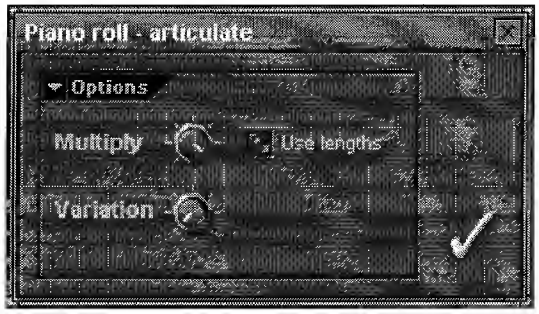
When checked, the drawn automation events are automatically interpolated upon mouse button release.

9. Center (0) – not on the number pad, 0 above the main keyboard.

Scrolls the grid so the playing position marker appears in the middle. Useful when you want to see the playing position in a long sequence.

Piano Roll Articulate

The Piano Roll Articulate tool allows you to apply quick portamento, staccato and legato layout to your scores.

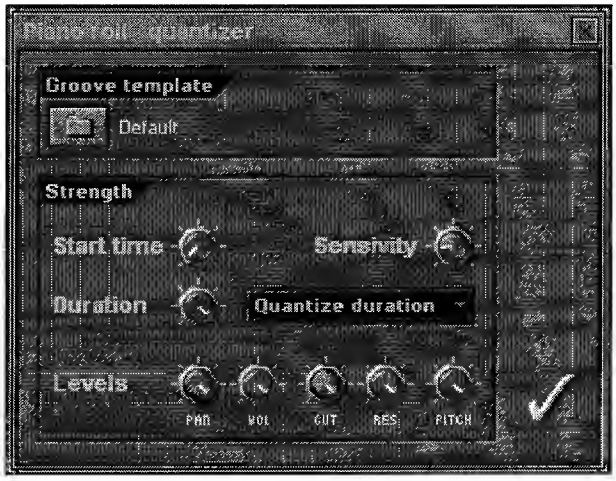


Options

- ***Options Menu***- Open the menu to find some useful quick presets.
- ***Multiply*** - Sets the length of the individual notes as a percentage of their length (10% to 100%)
- ***Use Length*** - If enabled, the length is calculated using the original notes' length, otherwise the length is computed so that the notes run in succession without gaps ('legato').
- ***Variation*** - Randomizes the length with the amount specified.

Piano Roll Quantizer

The Piano Roll Quantizer is an advanced note quantizer, that can use standard score files as groove presets. Quantizing is the process of aligning the start and end of the notes in the Piano Roll with bars or exact subdivisions of them, in other words correct real-time MIDI keyboard/controller entered timing errors or to create a specific groove (feel) to the beat.



1. Groove Template

The Piano Roll Quantizer uses standard FL Studio Score files (.FSC) as groove templates to quantize the notes.

The Piano Roll shows the snap grid (vertical red lines) generated by the groove preset.

2. Strength

This section lets you set the options that will be used for quantizing.

- ***Start Time knob*** - Lets you mix the original start times of the notes (turn left) with the quantized start times (turn right).

- ***Sensitivity knob*** - Lets you set the snap sensitivity. Determines how close to the grid a note needs to be before it is quantized. Turn the knob to right to increase the sensitivity.

- ***Duration knob*** - Lets you mix the original duration of the notes (turn left) with the quantized duration (turn right). In Quantize End Time mode (see below), this knob mixes the end time position instead.

- ***Quantize Mode combo box*** - Selects the quantize mode. The start time is quantized in all modes. Quantize Duration: quantizes the length of the notes according to the snap grid; Quantize End Time: snaps the end time of the notes to the snap grid; Leave Duration: retains the original note duration after snapping the start time of the notes; Leave End Time: retains the original end time of the notes.

- ***Levels knobs*** - With these controls you can mix the original note properties (turn left) with those used in the groove preset (turn right).

- ***Humanize switch*** - When switched on, the levels knobs can be used to set the amount of randomization applied to the note properties. Turn the knobs to right to apply more randomization.

- ***Randomize button*** - Changes the randomization seed for the humanized properties.

Guides for Making Groove Templates

The templates are regular Piano Roll scores, however they are interpreted in a special way to fit the purposes of the tool. Open one into an empty piano roll.

Only the position and length of the notes are used. Pitch is ignored.

Note start times are attracted to the nearest start time of the notes in the template. A similar process occurs for the end times.

Piano Roll Chopper

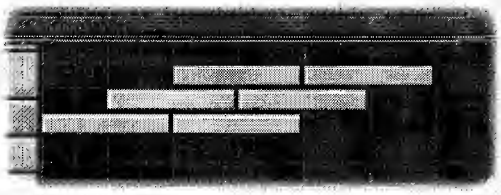
The Piano Roll Chopper is an advanced note slicer, than can use standard score files as patterns for slicing. This can be used to create gating style rhythms and chop up longer notes into specific patterns.

Options

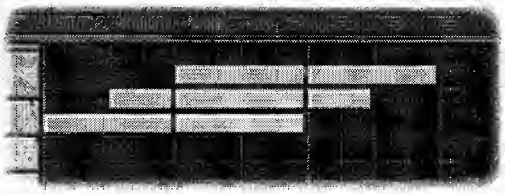
1. Pattern - Piano Roll Chopper uses standard FL Studio Score files (.FSC) as slice patterns. Click the Browse button to select a groove template. The Piano Roll shows real-time preview of the results. See below for some guides about making such patterns.

2. Options - lets you set the options that will be used for slicing.

- ***Time Multiplier knob*** – allows you to increase (turn right) or decrease (turn left) the speed of the pattern tempo. By default, the chopper uses the original pattern speed.
- ***Absolute Pattern switch*** - When switched on, slicing is based on the Piano Roll grid. When switched off, each note is sliced relative to its start time (see example image below).



Absolute Pattern: OFF



Absolute Pattern: ON

- ***Levels knobs*** - with these controls you can mix the original note properties (turn left) with those used in the chop pattern (turn right).

Guides for making Chopper patterns

The templates are regular Piano Roll scores, however they are interpreted in a special way to fit the purposes of the tool.

Pitch is not ignored, so this can be used to create transposed melodies out of a chopper preset using a single root note.

A yellow note is ignored for chopping, so it can be used to define the length of the pattern, and is useful to fine-tune the length of looped patterns.

The start of the score matches the start of the processed score in absolute pattern mode, and the start of each individual note relative pattern mode (absolute mode off).

Piano Roll Arpeggiator Tool

The Piano Roll Arpeggiator tool allows you to apply arpeggio effect to your scores based on fully customizable arpeggio scores and a set of additional options. Unlike the arpeggiator available in the Time Channel Settings, this is not a real-time effect, however it allows a much higher level of customization and control.

Options

- ***Pattern*** *(Browse)* - Allows you to load an FL Studio Score (.FSC) file to be used as an arpeggiator pattern. See guides for creating such scores below.

- ***Pattern*** - You will see the following options. Normal: uses the pattern as defined; Flip vertical: reverses the order of the notes in the pattern; Alternate: alternates between normal and flipped mode with each repetition.

- ***Time Multiplication*** - Stretches the time of the pattern score by integer amounts (1x, 2x, 3x, 4x slower when turned right and 1x, 2x, 4x, 8x faster when turned left).

- ***Range***- The pattern range in octaves. This will basically switch the pattern to a higher octave on each repetition until the range allows. The cycle then repeats itself. When the range is "--", each new note in the pattern is offset by 1 octave.

- ***Range Pattern*** - The combo box on right of the Range property sets the octaves order similar to the Pattern property, however it applies to entire octaves.

- ***Sync*** - Lets you select what kind of event is considered the end of the loop in the loaded pattern. Time: this selection will disable repetitions; Block: end of loop is considered the time all notes are turned off; Chord: end of loop is considered the time when one of the notes from the chord turns off;

- ***Gate*** - Shortens the length of the arpeggiated notes by the specified amount to create a gating effect.

- ***Levels*** - Allows you to mix the per-note levels (pan, volume, pitch etc.) of the current score with those of the loaded pattern (turn to right to mix more of the levels in the pattern).

Guides for making Arpeggiator patterns

The arpeggiator only works on chords the user plays it does not create the chords, the arpeggiator pattern provides the rhythmic playback and arpeggiation. Various Piano Roll colors are used to convey this information. Arpeggiator patterns are regular Piano Roll scores, however they are interpreted in a special way to fit the purposes of the Arpeggiator tool.

The notes in the pattern are considered relative to the note being arpeggiated. C5 means the arpeggiated note, C#5 is the next note in the chord, etc.

A note that covers the whole pattern is considered a 'sustained note' - a note that won't be arpeggiated, and left intact.

A yellow note is ignored, it is used to define the length of the pattern, and is useful to fine-tune the length of looped patterns (the repeat rate of the arp).

Purple notes are not affected by the octaves range set in the dialog, and are useful for providing more complex behavior in your patterns.

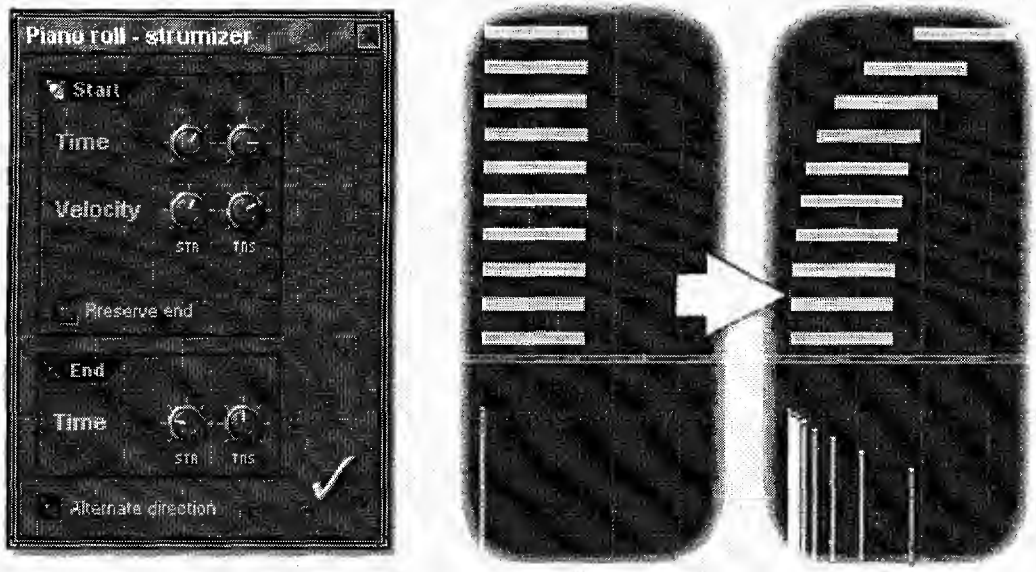
Piano Roll Strum Tool

The Strum tool lets you shift the timing and velocity of the individual notes in chords to simulate strumming (as in the playing of a guitar or other stringed instrument).

Any set of partial or fully overlapping notes that share the same start time are considered a chord. The dialog box lets you set three kinds of modification to the chords: start time shifting, velocity shifting, and end time shifting.

1. Start section

Enable this section by activating the led at its top left corner. The Start section lets you modify note start time and/or velocity.



Time

Lets you shift the start time of chord notes to create a strumming effect.

- ***Start knob*** - Adjusts the amount of time shift applied to the notes. You can also apply negative shift to strum from high notes to lower notes.
- ***Tension knob*** - Adjusts the strum 'tension', i.e. acceleration. Set a positive value to accelerate the strumming, or a negative value to decelerate.

Velocity

Allows you increase or decrease the velocity (volume) of the subsequent notes in strummed chords.

- ***Start knob*** - Adjusts the amount of velocity shift applied to the notes. A positive value decreases the velocity with time, while a negative value increases it
- ***Tension knob*** - Adjusts the velocity shift 'tension', i.e. acceleration. Set a positive value to decelerate the shifting with time, or a negative value to accelerate it.
- ***Preserve end*** - Enable this option to preserve the end time of the affected notes (note that the End section can still modify the end time) thus modifying the notes' length.

2. End section

Enable this section by activating the LED at the top left corner. The End section lets you modify note end time.

Time

Lets you shift the end time of chord notes.

- ***Start knob*** - Adjusts the amount of time shift applied to the end of the notes. You can also apply a negative shift.
- ***Tension knob*** - Adjusts the strum 'tension', i.e. acceleration. Set a positive value to accelerate the effect with time, or a negative value to decelerate it.

3. Alternate Direction

Enable this option to reverse the strumming direction for every odd chord (single notes are ignored when counting the chords).

Piano Roll Flam Tool

The Piano Roll Flam tool allows you to add 'drum flam' effect to your scores. Flamming is essentially adding quick strokes before every note, an effect that is very useful in adjusting percussion performances.

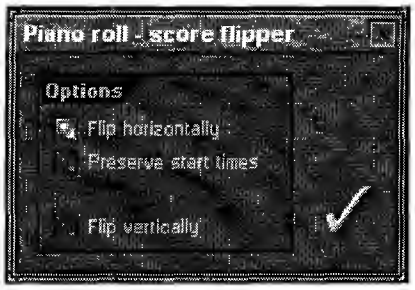
Options drop down menu

Open the drop down menu to find some useful presets.

- ***Time*** - Sets the length of the quick strokes added before each note.
- ***Absolute*** - Selects absolute or tempo-based time for the Time knob.
- ***Before*** - Places the quick strokes before the original note start time.
- ***Velocity*** - Sets the velocity applied to the quick strokes.

Piano Roll Score Flipper

Flip can invert scores both vertically (key) and horizontally (time). The tool operates only on selected notes, otherwise it affects the entire score in the window.

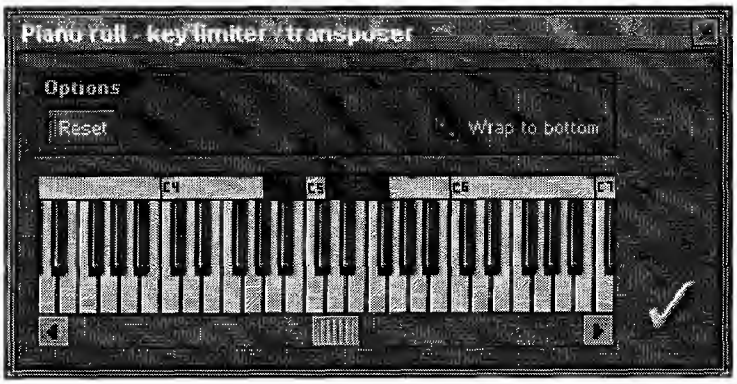


Options

- ***Flip horizontally*** – Flips the score in time. The last note is first, and the first note is last.
- ***Preserve Start times*** – With this option off the flip would be a 'perfect mirror' of the original score. When on, it aligns the start times of the flipped notes with the start times of the original notes. Use this to preserve the timing of the original score.
- ***Flip vertically*** – Flips the score by key, the top notes become the bottom, and the bottom top.

Piano Roll Key Limiter/Transposer

Limit and transpose the notes of a score within a custom defined note range. The tool can be used to generate quick derivative scores from a single source. You can then assign the derived scores to new instrument channels to create richer arrangements.



- ***Reset*** - Resets the limit to the range set by the selected notes in the score (or all, if none are selected).
- ***Wrap to Bottom*** - Normally the tool attempts to transpose each key down with an octave until it fits inside the defined limit. However, with this option enabling the notes will automatically wrap to the bottom-most octave in the limit.
- ***Piano View / Limit selector*** - Drag the ruler (pale orange bar) to define preferred key limit. Right click to set the root key (offset) applied to the notes.

Piano Roll Randomizer

The Randomizer dialog lets you create random notes in the Step Sequencer, or Piano Roll (depending on the selected window). The notes can be restricted to a chord. The dialog also allows you to randomize the notes properties such as pan, velocity etc.

Several options (such as Length, Variation, Stack etc.) are available only for the Piano Roll window.

1. Pattern Section

This section lets you set up the options used when generating the random notes (disable the section if you don't want to add random notes).

- ***Octave*** - Sets the base octave used when generating notes.
- ***Range*** - Specifies the octave range for creating random notes.
- ***Key*** - Sets the base tone for notes.
- ***Scale*** - Here you can select the chord type that will be used as a base for creating notes.
- ***Length*** - Sets the note length used for the generated notes (available only for the Piano Roll).
- ***Variation*** - Sets the note length variation for the generated notes (available only for the Piano Roll). Turn the knob to left to make the notes equal to, or shorter than, the specified length. Turn to right to make notes equal to, or longer than, the specified length (the middle position disables the length variance).
- ***Population*** - Specifies the number of notes that will be generated. The more you turn this knob to the right, the more the notes generated.
- ***Stack*** - Sets the note polyphony used for the generated sequence (available only for the Piano Roll).
- ***Random Portamento*** - If checked, the notes will have random values for the portamento switch (checked or not) in the Miscellaneous Channel Settings.
- ***Merge Same Notes*** - If checked, two or more consecutive notes of the same pitch will be merged into a single longer note.
- ***Seed*** - Click the back and forward arrows to generate random note combinations based on the settings above (in all selected channels for the Step Sequencer, or the selected timeline section in the Piano Roll). You can use this feature to generate various (seeded)

combinations until you're satisfied with the result. To hear the combinations you generate, hit the play button in the Transport panel before you bring up the Randomizer dialog (or you can also call the Randomizer and then press Space to toggle play/stop mode).

2. Levels Section

This section lets you set up the options that will be used to randomize the levels (pan, velocity etc.) for all selected notes/channels (disable the section if you don't want to randomize the note levels).

- ***Levels*** – Allows you to select the note properties you want randomised, and the amount of randomization (this applies to the note levels only, not automation events!). Each knob has a range from 0% to 100%. At 0% the levels are left at their original values.
- ***Reset Before Processing*** - Resets the note levels to their default values before randomizing.
- ***Bipolar*** – Select to randomize the note levels to be both higher and lower than the original values (as opposed to shifting them only higher or only lower depending on the knob values).
- ***Seed*** - Click the back and forward arrows to randomize the note properties based on the settings above (in all selected channels for the Step Sequencer, or the selected notes in the Piano Roll). You can use this feature to generate various combinations until you're satisfied with the result. To hear the combinations you generate, hit the play button in the Transport panel before you bring up the Randomizer dialog (or you can also call the Randomizer and then press Space to toggle play/stop mode).

Piano Roll Scale Level Tool

The Scale Levels tool allows easy manipulation of the velocity level data associated with the selected notes. This is a great way of raising the overall volume of a performance while maintaining the relative note velocity differences.

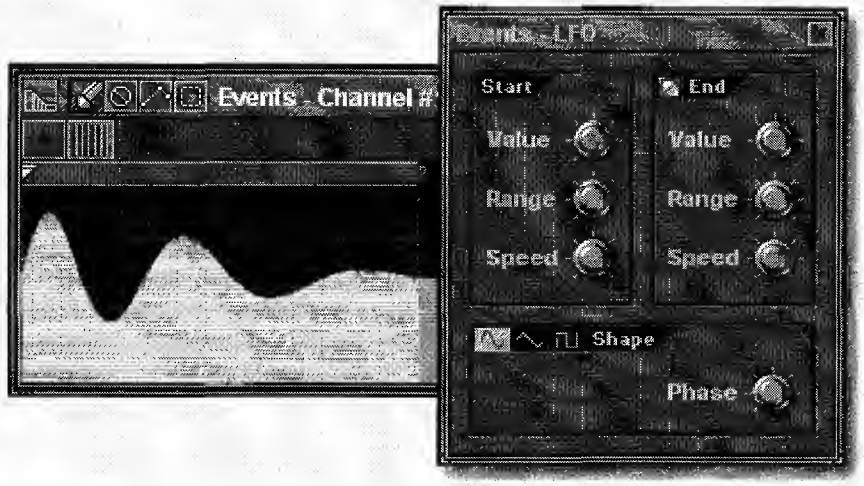
- ***Tension*** – Re-scales the level logarithmically.
- ***Multiply*** – Multiplies the level by the value indicated.
- ***Offest*** – Adds to the level.

Piano Roll LFO Tool

The LFO tool allows you to draw LFO shapes in the Event Editor. The LFO is drawn only in the selected time range. If nothing is selected, LFO will select automatically the first bar.

1. Start

- ***Value*** - Sets the value of LFO.
- ***Range*** - Sets the range between the lowest and highest points in LFO.
- ***Speed*** - Sets the frequency, or speed of the LFO. Right-click for a menu with tempo-based presets.



2. End

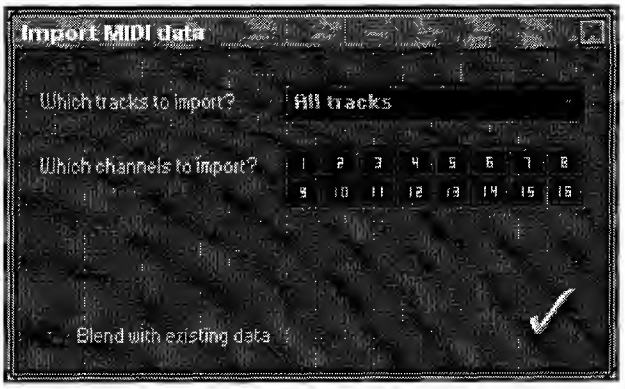
Contains the same parameters as the Start section. When you turn on the LED in the top left corner the LFO settings will vary from those in the Start section to those in the End section. If the LED is turned off, then only the settings from the Start section are used.

3. Shape

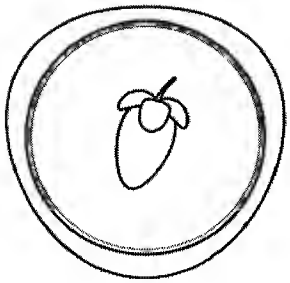
Sets the shape of the LFO - sine, triangle or square (to select a shape, click any of the icons at the top left corner). Phase knob sets the phase of the LFO (moves the LFO shape left and right).

Import MIDI Data Dialog

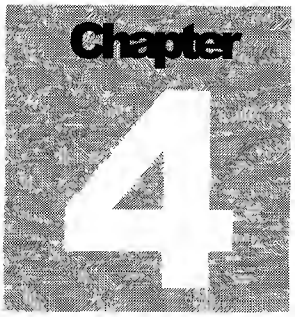
This dialog shows how to import notes into the Piano Roll, from either a MIDI clipboard or file.


Import MIDI data
Which tracks to import?
All tracks
Which channels to import?
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
Blend with existing data

- ***Which Tracks to Import*** - Click the combo box to select which MIDI tracks to import in the Piano Roll.
- ***Which Channels to Import*** - Lets you select which channels should be imported. Left-click a channel number (it will be marked in red) to include it in the imported channels, right-click it to exclude it from the imported channels.
- ***Blend with Existing Data*** - When turned on, imported notes will mix with the already existing ones. Otherwise the existing notes will be overwritten by imported data.

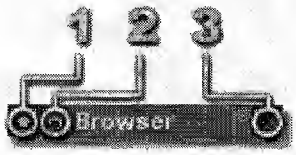


'Seek and you will find.'
Matthew 7:7



The Browser

The Browser is a file browsing system for convenient access to your sample collections, presets and projects, directly inside FL Studio. The Browser title bar contains the following controls:



1) ***Collapse Structure*** - Collapses all expanded folders in the Browser window.

2) ***Reread Structure*** – Re-reads the contents of all folders in the Browser. Click this button to see any new files and folders that were created after FL Studio was started.

3) ***Close*** - Closes the Browser. Use this to gain more screen space if it's tight.

Project Browser

The Browser contains a special folder named Current Project. When expanded, this folder shows a list of patterns that contain events for one or more automated controls. For more information, see the Project Browser page.

TIP: This is a great, so pay attention! Drag and drop browser files onto the corresponding locations in FL Studio, and the item type will be loaded. For example, when saving presets from FL Studio and 3rd party plugins in the browser and later dropping them on existing channels, the generator type will be replaced. Now, that's a good workflow. Right clicking the icon in front of a sample/preset/flp/ sends it to the selected channel. The browser can also be docked on the left or right side of the main window (just drag it to either side of the screen).

Browser Items

Each file appears in the Browser with a special icon on the left side of its name:

FL Studio project files

Left-click to load the project in FL Studio:

FL Studio loop file (.**FLP**) - Left-click to load the project in FL Studio.

This is the native project format of FL Studio. It retains all data that belongs to your project, including patches and settings for all instruments, FX and channels, but does NOT include sample data or DrumSynth/SimSynth presets that are included in the loop files. If you open a loop file that doesn't have the required samples or presets, FL Studio performs a search in the folder where the loop file was loaded from, then its sample folder, and all custom folders that are added to the Browser (see Directories). If you want to skip the check, press and hold ESC key when you see the loading icon in the hint bar.

TIP: If you are wondering why some FLP files are larger than others with similar numbers of channels, recorded controller data quickly increases the size of FLP files. Nothing alarming in that. If, however, you need to shrink the size of a FLP, try changing the PPQ setting in the project Options>Project general settings>Time base (PPQ) to a smaller value, and re-saving to a new FLP.

Zipped loop file (.**ZIP**) - Left-click to load the project in FL Studio.

This is the save format that includes all the data of the FLP file, plus all samples and SoundFont files. This is a great way to archive important projects and share with collaborators when the project uses samples that are not standard in FL Studio. These are standard ZIP files with a FLP inside. FL Studio opens and uncompress the ZIP, then searches for a FLP file and opens it. Any samples included in the ZIP file will be loaded, if they are included in the FLP.

WARNING: Be careful. Depending on the size of your project sample data, these ZIP projects can grow to alarming proportions. Keep an eye on that.

Samples and Patches

Left-click to preview samples (WAV/MP3) and some presets (DS, SS), SoundFonts and Instruments can't be previewed. Right-click to send to the currently selected channel or new Sampler, Granulizer or Fruity Slicer channel:

Wave sample /TS404 shape (**.WAV**)

WAV, or wave file, is for storing audio data, commonly used in music production and on PCs. This format covers a range of sample rates and bit depths (you can read more on this in the rendering section). The FL Studio Sampler channels and FPC can use this format. Supported wave sub-formats include PCM Waveform and any ACM waveform, as long as you have the required codec properly installed and working.

SoundFont library (**.SF2**). Can only be sent to a Fruity SoundFont player channel.

SoundFont files are the sample data format used by the Fruity SoundFont player. They contain WAV data and setup information that allow this plugin to play multi-sample, multi-layer sounds. This means that SoundFonts can contain a several unique samples (with filtering and envelopes) for every key on your controller keyboard. Good SF2 files will probably be quite large, more than 2 Meg each, and we have seen SF2 files over 300 Meg.

TIP: SoundFonts are your key to realistic sounding acoustic instruments in FL Studio. Google 'Free SoundFonts', and start downloading.

Speech preset (**.SPEECH**). It's a pair of lips, if you were wondering.

This is the load/save format for the FL Studio integrated speech engine, allowing you to quickly add Vocoder-like, or natural vocal parts, to your projects. The .SPEECH presets are supported by all native FL Studio plugins that use custom samples for synthesizing – Sampler, Granulizer, Fruity Slicer and Fruity Scratcher.

SimSynth preset (**.SYN**)

The Sampler channel can use presets from SimSynth 1 & 2 directly. A wave file is generated automatically from the SimSynth preset when loaded into FL Studio. SimSynth is a software synthesizer written by David Billen. You can get SimSynth from www.flstudio.com (SimSynth 1 is now freeware ☺). When you load a SYN file instead of wave file, you gain some additional options in the Miscellaneous Channel Settings page, concerning the generated wave by SimSynth's engine integrated in FL Studio.

NOTE: Simsynth and Drumsynth should not be confused with Simsynth Live and Drumsynth Live. In particular, .SYN files are rendered presets, so can be seen as samples, while Simsynth Live is a real-time generator based on the same synthesizer.

DrumSynth preset (.**DS**)

The Sampler channel can use presets from DrumSynth directly. A wave file is generated automatically from the DrumSynth preset when loaded into FL Studio. When you load a DS file instead of wave file, you gain additional options in the Miscellaneous Channel Settings page, concerning the generated wave by DrumSynth's engine integrated in FL Studio.

FastTracker extended instrument (.**XI**)

XI is the extended instrument file format of FastTracker. The Sampler channel can 'extract' a wave sample from XI file directly, but note that some XI files contain more than one wave sample. Since Sampler supports only single wave per channel, only one of the available waves will be imported. Envelope and LFO settings are not imported.

Other

Left-click to preview (applies to Sampler presets only). Right-click to send to the current or new channel (applies to channel presets only):

Generator/Effect preset (.**FST**)

State files in FL Studio are used to save generator and effects presets. Note that this includes both FL Studio AND 3rd party plugins.

Right-click to apply the score to the current channel:

FL Studio Score file (.**FSC**) or MIDI file (.**MID**)

Right-click to apply the humanize preset to the current channel:

TIP: If you drag an FST preset from another plugin onto an existing channel, it will load that plugin type and patch. This is a great way to change from 3OSC to Sytrus without losing the note/pattern data in the channel.

Humanize preset (.**FPR**)

Right-click to apply the score to the current channel:

Piano Roll score.

Most of the items can be also applied with standard drag and drop operations. For example, to apply a channel preset, just drag and drop it on the appropriate channel settings button (see Step Sequencer), or drop it directly on the Channel Settings window. You can drop the channel preset or sample below the last channel to create new one.

Browser Folders

Left-click a folder to expand/collapse it. Right-click and select Explore Folder to open the folder in a Windows Explorer window. Rollover the name of a folder for a short description. The folders seen by default in the Browser window include:

All subfolders of FL Studio Folder/Samples - collection of **generator/effects presets**, scores, samples etc. **To change a preset , simply drag the item from the browser menu and drop it on the instrument or FX channel**.

FL Studio Folder/Loops - collection of sample projects (FLP files). This folder is seen in the Browser as 'FLP loop files'

You can also add custom folders to be seen in the Browser from the Options> File Settings menu.

Project Browser

The FL Studio Browser contains a special folder named Current Project. This folder contains various information about the current project, such as a list of patterns, automated controls, generators and an undo history list. This page explains the folders in the Current Project section and the information they hold.

History

The folder contains a set of undo steps ('history'). The last action you performed is at the bottom of the list. You can go to any available step in the history by left-clicking on that step. You can also browse through the history by using the available Undo and Redo commands in the Edit menu.

The maximum number of history steps depends on your Options > General Settings.

Automation

The folder contains a list of initialized & automated controls:

Initialized Controls

The Initialized Controls folder contains a list of controls that were initialized. Right-click an entry and select Delete Event to remove the initialization.

Patterns List

All patterns that contain one or more automated controls are listed in the Automation folder as folders. The folders contain the automated controls themselves.

Left-clicking an entry for a control opens its Event Editor.

Right-clicking displays a menu that allows you to open an Event Editor in a new window and link the control to a MIDI controller for remote controlling.

Generators / Effects

The Generators and Effects folders list all generators and effects, respectively, that are used in the project. This does not include integrated generators, such as Sampler, TS404, Layer and others.

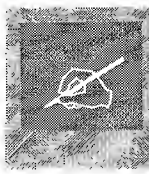
Each generator/effect is listed like a folder containing all automatable controls for the plugin:

Left-clicking an entry for a control opens its Event Editor.

Right-clicking displays a menu that allows you to open an Event Editor in a new window and link the control to a MIDI controller for remote controlling.

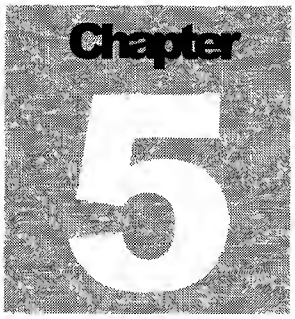
Remote Control

Contains a list of controls that were linked to MIDI or internal controllers. Right-click an item in this folder to see the automation menu for the control.



NOTE: The Automation folder can also list patterns containing Piano Roll data and the individual scores in each pattern. Right-click the Automation folder and deselect Show Automation Only (on by default). You will see a list of patterns that contain Piano Roll sequence(s) as well.

'The gods are just, and of our pleasant vices make instruments to plague us.'
William Shakespeare



Instruments

Each channel in FL Studio contains one instrument (generator). The generator is a sound generating sub-program such as a synthesizer or sampler, used to create the melody or percussion. FL Studio comes with many built-in generators, and also supports 3rd party plugin generators in VSTi and DXi format (see the Fruity Wrapper's built-in help), and FL Studio's own generator plugin format. FL Studio native generators are generally better integrated with the host, as actions such as 'per note' slides etc are possible.

A word about 3rd party plugins

The Internet is bursting with VSTi and Dxi plugins, a great place to start looking is www.kvr.com. Please bear in mind that many of these plugins, particularly the free ones (although not always), don't conform in some small way to the VSTi and Dxi standards. This means that the stability of FL Studio, and any host application, may be compromised when you are using them. So have fun, but remember, save often, and thoroughly test your 3rd party plugins before doing any 'mission critical' work.

NOTE: Although included in the installation package, **not all FL Studio instruments are free**. Sytrus, for example must be purchased separately from www.flstudio.com. If an instrument is a demo version, you will be able to use it, and render audio files, but not save the channel data along with a project file (FLP or ZIP). If you try to save the FLP with a demo instrument you will receive a warning that the channel data will not be saved. You can, of course, copy the data to a new channel (that contains a free/owned plugin), and then save the FLP. **However**, Sytrus, SimSynth, DX-10, DrumSynth, SoundfontPlayer & VideoPlayer are included in the XXL version of FL Studio, this is an inexpensive way to gain access.

Installing VST & DX Plugins

Plugins usually come in the form of a 'dynamic link library' (.DLL) file, containing a program that can be invoked by FL Studio to perform the desired function. Installing plugins, instruments and FX is far easier than you may expect - if only every installation process were this easy. Installation usually involves 1) copying a few .DLL files to a directory (or pointing an installation package to install to that directory), and 2) refreshing the plugin list in FL Studio so that they are available for use. You will probably collect quite a few 3rd party plugins so here's our advice -

1. **Create a plugin directory** where you will save ALL your 3rd party plugins, somewhere outside the FL Studio install structure, e.g. C:\MyFLStudio\Plugins.
2. **Set C:\MyFLStudio\Plugins as the VST search directory** (Options>File Settings). Press **F10** on your typing keyboard, select the **File tab** at the bottom of the file window you will see '**VST plugins extra search directory**'. Click on the folder icon and browse to **C:\MyFLStudio\Plugins** directory and **click OK**. FL studio will now look in this directory for plugins to use.
3. **Create sub-directories for FX and Instruments** (be organized, as later you will have no idea what is an instrument or FX plugin among your .DLLs). Then, for each plugin you install, make a new sub directory in the appropriate Instrument or FX directory with the supplier's name, e.g. C:\My FLStudio\Plugins\Instruments\ReFx, for any instrument plugins from ReFx.
4. **Install the plugins (.DLLs etc).** This will usually be a copy procedure. If installation uses an installer, override the default install directory and point it to your VST directory.
5. **Refresh the plugin list.** Click:: Channels>Add one>More>Refresh>Fast scan.

Your plugin should now be visible in the plugin list window. Newly found plugins will show up as red items until the next time FL Studio is started, when they will revert to black. **DX plugins can be installed in your VST directory (for convenience),** however Windows will take a greater role in the installation process and will 'register' the plugin, so you can choose to put them anywhere.

6. **Go to www.kvraudio.com** for a huge collection of FREE and commercial plugins.

NOTE: Usually, **instruments** won't run in FX channels, and **FX** won't run in instrument channels (there are occasional exceptions). FL Studio can't tell if a 3rd party plugin (.DLL) is an Instrument or an effect, without loading it first. If you try to run the wrong plugin type in the Channel or Mixer windows, you get an error box telling you about the mistake that you have just made (DOH!). This is nothing to worry about, we all do this from time to time.

The Channel Wrapper

All instruments (including FX), native and 3rd party, are 'interfaced' to FL Studio through a piece of code known as the Channel Wrapper. The Wrapper is compatible with Steinberg's VST2/VSTi plugin and the DX plugin standards (the screenshot shows the Wrapper hosting DreamStation DX).

There are two versions of the Fruity Wrapper, Effect & Generator. FL Studio will select the appropriate wrapper depending on the location of the loaded plugin. There are several control options -

Parameters

1. ***Input/Output Port*** - Allows you to set the input/output MIDI port mapping for the hosted plugin (depending on the selection in the Additional Settings Menu, see below).
2. ***Additional Settings Menu*** - Additional menu with plugin specific commands. The appearance of this menu depends on the hosted plugin.

   Common commands

   - ***Show MIDI In Port / Show MIDI Out Port*** - These menu items let you display either the assigned MIDI input or output port (1) assigned to the plugin.
   - ***Reload Current Plugin*** - A quick way to reset the plugin to its initial state (bottom of drop-down list).

   Plugin operation

   These features are provided to allow you to **trouble-shoot 3rd party plugins** that don't behave themselves inside FL Studio. Trial and error is OK, if you must ☺. Be aware that the default states are compliant with all plugin standards, so switching any of the following settings on may cause problems for plugins that conform to standards.

   - ***Use fixed* size buffers** (all plugin formats) – FL Studio shares data with plugins using variable sized chunks of data (buffers). Some plugins require fixed sized buffers. This option ensures only fixed sized buffers are used. The disadvantage is that fixed size buffering introduces an extra delay. The delay depends on the audio

buffer size selected in the Audio settings (F10). This delay is double for effects plugins.

- ***Render mode notify*** (VSTs only) This ensures that the plugin is informed when FL Studio is rendering. Some plugins will automatically switch to a higher quality output when rendering.
- ***Check current program on display change*** (VSTs only) Some plugins send a display change message when a new patch (program) is selected from within plugin. This option allows FL Studio to detect the patch change and ensure data is correctly copied between FL Studio and the plugin.
- ***Process inactive outputs*** (VSTs only) Some plugins mark one or more of their outputs as 'inactive' even though they are being used. By default, FL Studio doesn't process inactive outputs, so no sound is produced. This option ensures FL Studio processes 'inactive' outputs.

VST/VSTi commands

These commands deal with managing plugins:

- ***Allow Program Editing*** - The default behavior of FL Studio is to treat the plugin programs as 'read-only', meaning that loading a program, modifying the plugin settings further, and reloading the same program will not keep the custom modifications. Enable this option to allow program modifications for the current plugin instance, much like many other VSTi hosts operate.
- ***Rename Program*** - Allows you to rename to currently active patch. Allow Program Editing needs to be turned on for this command to be enabled.
- ***Copy Program*** - Copies to currently active patch to the clipboard. Allow Program Editing needs to be turned on for this command to be enabled.
- ***Paste Program*** - Overwrites the settings of the active patch with the one in the clipboard. Allow Program Editing needs to be turned on for this command to be enabled. The command will be disabled in the clipboard is empty (you need to copy a program first).
- ***Import Cubase Bank/Preset*** - Allows you to import a standard Cubase bank (FXB) or preset (FXP) in the currently hosted plugin instance. A bank replaces all of the programs for this plugin instance, while loading a preset replaces only the currently active program.
- ***Export Cubase Preset*** - Allows you to export the current patch as a Cubase preset (FXP).
- ***Export Cubase Bank*** - Allows you to export the entire program library (including any additional loaded or modified programs in it) as a Cubase bank (FXB).

DXi commands

- ***Use Big Buffers*** - FL Studio optimizes data flow and processing via using very small variable sized buffers. While the majority of plugins are completely

compatible with such processing, some DXi plugins might cause a problem. In this case enable this option so the wrapper provides a compatibility mode for the plugin.

3. ***Plugin Menu*** - This menu contains various plugin specific commands such as preset management, MIDI mapping and service functions. The commands are different depending on the type of plugin loaded in the wrapper.

    - ***Presets*** – Allows you to see the list of presets available for the plugin.
    - ***Browse presets*** – Opens the presets menu in the browser (this may not have any presets for the plugin, however).
    - ***Save presets as*** – Allows you to save the current preset as a single preset file in the browser. Very useful!
    - ***Last tweaked parameter*** – Allows the following operations to be performed on the last knob/slider that was moved on the plugin interface (**very very very useful!**)
        i. ***Link to controller*** – Opens a dialog so that you can link the last moved knob to an external or internal controller.
        ii. ***Create automation clip*** – Creates an automation clip linked to the last moved knob.
        iii. ***Edit events*** – Opens the Event editor for the for the last tweaked control. This data will be saved in the currently selected pattern.
        iv. ***Init song with this position*** – Defines the position the knob will start in when the song starts to play. You will need to press STOP, then PLAY, for this to take effect.
    - ***Browse parameters*** – Allows you to see the list of automatable parameters in the browser.

TIP: To link a knob in a 3rd party VST to an external controller 1) Move the target control knob with the mouse. 2) Open the Additional setting menu on the Wrapper 3) Select ***Link to controller*** menu item and 4) Move the external controller knob to be linked. DONE!

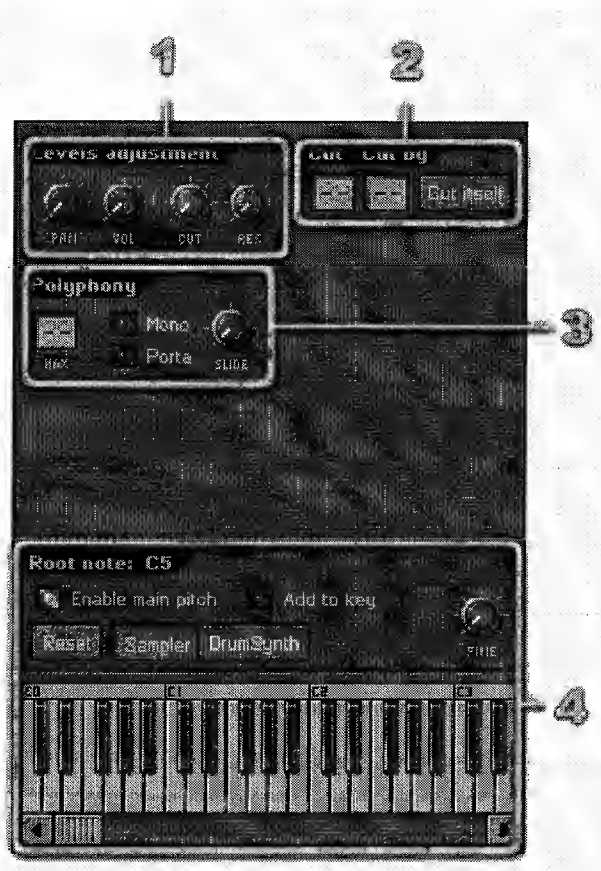
4. ***Select a Plugin*** - Allows you to replace the hosted plugin with another one.

Plugin Credits: Frederic Vanmol, Didier Dambrin

Channel Settings

This option maps the various generator inputs and outputs to the main program. The Channel Settings page contains various user selectable generator settings.

1. Levels Adjustment



This section contains four knobs that control the volume (VOL), panning (PAN), cutoff (CUT) and resonance (RES) levels of the channel. Essentially, these duplicate the functionality of other controls found in the Channel Settings window, but are useful for the following reasons:

Easier automation - You can, for example, create a fade in/out effect for a channel, using the volume adjustment knob instead of the channel volume control. This allows you to independently set the overall volume level using the channel volume knob, without needing to recreate the automation data. Similarly, you can set the pan adjustment knob to create panning LFO without automating the channel pan knob, i.e adjust overall panning without recreating any automation data.

Wider range - The volume adjustment knob has a range of 0% to 200% as opposed to the channel volume knob (0%-100%). This allows you to preamp the volume up to twice the original level, without using additional effects.

2. Cut / Cut By

- ***Cut/Cut By*** – Use this to set the triggering of a note in one channel to cut notes in another one. Set the Cut value (LCD on the left) to a number in the channel that will cut notes, then set the Cut By value (LCD on the right) to the same number in another channel (that will be cut from the first one). FL Studio will not detect if the Cut value is set to the same number in several channels, so you can create any combination to suit your needs.

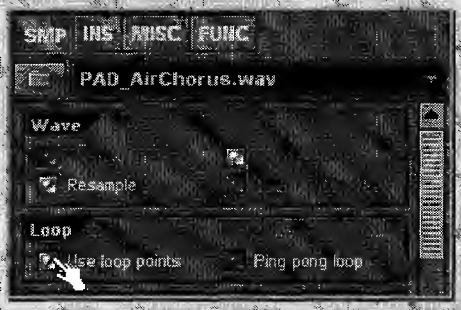
- ***Cut itself*** - Set its Cut/Cut By values to the same number. FL Studio will do this automatically (finding unique numbers, not used in other channels) if you check the Cut Itself button.

Please note that the cut function will set all the related notes' envelopes to release. So if you have set a long release, you will still hear the notes fading out after they were cut. Also, this section will not appear in the TS404 generator, as it uses a different approach for generating sound.

Performance tip – Using the Channel settings envelopes.

1. Load the 'PAD_AirChorus' into a sampler channel. This sample is in the Packs>Pads folder of the browser.

2. Turn on the 'Use Loop Points' option in the SMP panel.



Continued...

Performance tip – Using the Channel settings envelopes.

3. Go to the INS panel, and turn down the filter cutoff knob to about one-third the way up, and the filter resonance knob all the way.

4. Access the CUT envelope. Right click on the 'Attack' (ATT) knob and in the 'Set' menu, select '4 steps'.

5. Turn the 'Hold' knob to zero, and set the 'Decay' knob to '4 steps' also.

6. Turn the AMT knob (far right) to the 9.00 O'clock position.

7. Try playing your newfound synth stab.

To make it more interesting, try sending it to a delay, and sweeping the filter cutoff. Put a nice drum loop behind it and you've got yourself the beginnings of a song!

3. Polyphony/Portamento

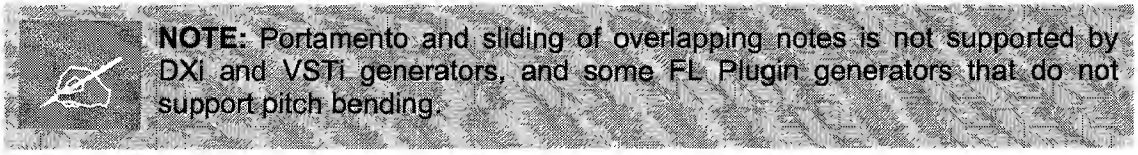
- ***Max Polyphony LCD*** *(MAX)* can be used to reduce the maximum number of voices the channel will play simultaneously. This can be useful to **lower CPU usage** or create specific 'voice stealing' effects, when only a few notes can sound simultaneously. If the LCD displays '--' dashes, this means that polyphony is unrestricted.

- ***Mono*** - Turning on the Mono button sets the generator to monophonic mode (maximum one note played at a time). In mono mode, when two notes overlap (the overlap amount does not matter) they will 'slide' one to another (including their properties - cutoff, resonance and panning). You can set the transition length with the Portamento Time knob.

- ***Porta*** - short for Portamento, is the technique of sliding between notes. Setting this button enables the portamento. In FL Studio, the portamento transition also includes all other properties of the note (cutoff, resonance and panning).

- ***Portamento*** *Time knob (SLIDE)*- is used to set the slide length when portamento is turned on. This setting is also used for overlapping notes in Monophonic mode. The more you turn the knob to right, the longer the slide.

This section will not appear in a TS404 channel, because it works only in monophonic mode.


NOTE: Portamento and sliding of overlapping notes is not supported by DXi and VSTi generators, and some FL Plugin generators that do not support pitch bending.

4. Preview Keyboard

The preview keyboard lets you preview (left-click a key) the generator, sets the root key (right-click a key), and set key region of the channel (drag the gray ruler to define the region).

- ***Root Key*** - The orange rectangle in the ruler above the piano keys shows the root key of the channel at which the sample will play back at its original recorded pitch. To set the root key right-click above the note you wish to set as the new root key. In this way you can transpose the note input to that channel. This function is also necessary to 'tune' samples that were not originally on the note C. When you set the root key to C6, FL Studio will map the pitch of the sample so that C6 retains standard pitch, and the pitch varies if played up or down from there. All other notes are generated by changing the sample speed, and thus changing its pitch. Thus, setting the root key higher makes all notes sound lower. For example, if a sample has a pitch of C5, and you map it to C6, FL Studio will consider that C5 sample as C6, thus shifting all notes down one octave.

- ***Key Region*** - When you set key region for a channel, all note events outside the region will be ignored (not played). This feature is not useful when using a channel by itself. However, when using a channel as a layer, to create complex instruments, you might want some of the layers to play only in their specified region, such as having different samples for each octave (each sample is placed in a separate channel). Drag the ruler above the piano keys to define key region for this channel. Once created, you can edit the limits of the region by dragging its end points.

The panel above the preview keyboard contains some additional options:

- ***Enable Main Pitch*** - If you turn this option off, the channel response to the main pitch value will be disabled.

- ***Add to Key*** - When this option is on, the root key works by offsetting the whole keyboard, including all key range specific options (like samples assigned to specific range of notes). So when you set the root key to C6, when it is normally C5, and play C6, it's exactly like if you played C5 with root key C5 (the preview keyboard shows the actual note being played in this mode as well). When this option is off, however, only the pitch is offset, and the rest of the features remain as they were with the default root key. So, if in the previous example you set the Add to Key option off, playing C6 will result in hearing a C5 tone, but with the samples and properties that are mapped to C6. This feature makes no difference for generators that have single sample and properties along the whole keyboard. However, it will act differently when used with generators like the Fruity SoundFont2 player or the Fruity Slicer generator, where different samples may be assigned to different keys.

- ***Reset*** - Sets back the default base note and removes the key region (all notes will be played). For the Sampler & DrumSynth that is C5. For SimSynth it depends on how the preset was set in SimSynth.

- ***Sampler & SimSynth/DrumSynth*** - These buttons appear only in Sampler generator, when SimSynth or DrumSynth preset is used to fill the sample bank in Sampler Channel Settings. If the Sampler button is clicked, the base note you set in preview keyboard is used as usual by the Sampler as a base tone of the sample (in this case the sample generated by the SimSynth/DrumSynth preset). When the SimSynth/DrumSynth button is clicked, the base note is used by the SimSynth's or DrumSynth's engines respectively for a pitch of the sample generated.

- ***Fine tuning*** *(FINE)* - You can use this knob to fine-tune the base note in cents. 100 cents are one semitone.

Function Channel Settings (FUNC)

The Function Channel Settings page is a set of event filters and processors: echo delay, arpeggiator, keyboard tracker, time shifting and gate. These processors are available for all generators (including 3rd party), except the TS404, which has a different sound generation approach that does not support echoed or arpeggiated notes (although you can still have echoes in TS404, see TS404 Channel Settings).

1. Echo Delay Section

This section lets you set up echoes for the channel, but be warned that this is NOT an audio delay line. It does not create echoes of the wave output of the channel, but creates echoes of the note events instead. This enables some special effects like pitch shifted echoes, but also requires additional CPU power for each echo generated as it is another synthesized sound to compute. If you want to use a standard delay line, use the Fruity Delay effect instead (see Effects).

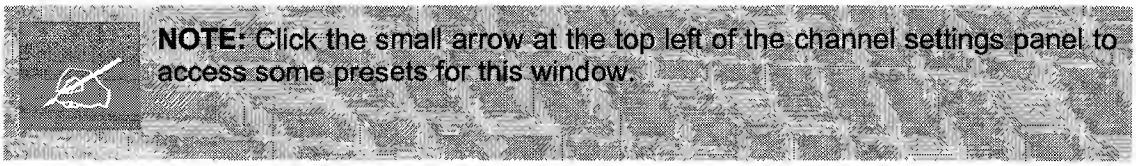
All options described below are applied additive to each successive echo. For example, if you set the pitch knob to +10 cents, the first echo will have 10 cents higher pitch than the original sound. The second will have 20 cents higher pitch than the original sound, and so on.

- ***Feedback*** *(FEED)* - Sets the volume of echoes. If this knob is centered, echoes have the same volume as the original note. Turning it to left creates fading out echoes. Turning it to right increases the volume of each successive echo. Turning it to the leftmost point turns echo delay off.
- ***Pan*** *(PAN)* - Sets the panning of echoes.
- ***Cutoff*** *(CUT)* - Sets the cutoff value of echoes.
- ***Resonance*** *(RES)* - Sets the resonance value of echoes.
- ***Pitch*** *(PITCH)* - Sets the pitch offset of echoes.
- ***Time*** *(TIME)* - Sets the delay period between echoes in units of beats. This enables you to set a tempo-based delay, so echo will follow song tempo changes.

- ***Number of Echoes*** *(# ECH)* - Sets the number of echoes generated for each note. It is recommended to keep this number down for **lower CPU usage**.

- ***Ping Pong*** - If turned on, the pan value will 'bounce' when it reaches 100% left or right panning.

- ***Fat Mode***- This is a special mode of the echo delay effect, that makes more subtle echoes with alternating panning - useful for creating flange and chorus-like effects. If this option is turned off, some options of the echo delay unit are reset to their defaults. The reason for this is that the volume settings you think are reasonable in fat mode, will sound excessively loud when in 'normal' mode.



2. Arpeggiator

This section lets you add a real-time, non-destructive arpeggio effect to the sequence of an instrument. To use the arpeggiator, select a direction from the icons in the top left corner of this section. The available options are: Off (default; turns off the arpeggiator), Up, Down, Up-Down, Up-Down (twice the lowest and highest notes), and Random (selects random notes from the range and chord specified).

Generally, the arpeggiator can operate in two modes - classic arpeggiator, based on any chords present in the sequence; or using a predefined chord template to apply to the instrument sequence. The mode is selected from the Arpeggio Chord option (see below):

- ***Arpeggio Time*** *(TIME)* - Selects the delay between the successive notes generated by the arpeggiator. Right-click the knob and select Set for time presets.

- ***Arpeggio Gate*** *(GAT)* - Applies gate to the notes generated, for creating short, staccato sounds.

- ***Slide*** *(Slide)* - Check this option to make the arpeggiator slide between notes. This option will not work with generators that do not support slides.

- ***Arpeggio Range*** *(RANGE)* - Lets you set the arpeggio range in octaves. The arpeggiated chord is transposed within the specified range to create additional notes for the effect.

- ***Arpeggio Chord*** *(CHORD)* - Select None if you want the arpeggiator to progress with a step of 12 semitones (1 octave) within the specified octave range. Select Auto or Auto (sustain) to set the arpeggiator in classic mode, to create arpeggio effects based on any chords contained in the instrument sequence. The rest of the presets are a set of

predefined chords that will be applied to the instrument sequence (sequence chords will not be arpeggiated as in classic mode). Auto (sustain) will not apply arpeggio effect on monophonic sequences (given that the octave range is set to 1)

3. Time

Two filters are available in this section - a gate that 'truncates' the note events when they pass a specified limit, and a filter that shifts note start time.

- ***Gate*** *(GAT)* - The time interval set by this knob is the maximum length of a note event for this channel - longer notes are truncated to the maximum length. Look in the hint bar (see Main Panel) to see the length you set in STEPS:TICKS format. Turn the knob maximum to right to disable the gate filter.

- ***Time Offset*** *(OFS)* - Turn this knob to the right to delay notes triggering with up to 16^{th} note time periods (one step).

4. Velocity/Keyboard Tracker

This section contains the settings of the velocity and keyboard trackers. The keyboard tracker 'links' the note number (i.e. note pitch) to the cutoff, resonance and panning properties of the notes. Thus, you can set the keyboard tracker, so a higher note offsets the cutoff frequency to a higher value, for instance. The velocity tracker works exactly the same, but instead of following note pitch, it uses note velocity.

- ***VOL/KB Switch*** - Click VOL to set the properties for the velocity tracker and KB to set the properties for the keyboard tracker. Selecting either of the trackers does not deactivate the other one, to turn off a tracker completely, reset its PAN, CUT and RES knobs (right-click a knob and select the Reset command).

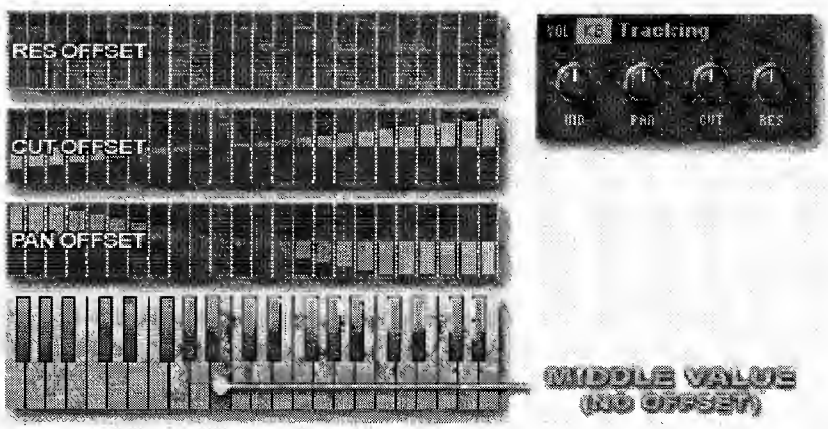
- ***Middle value*** *(MID)* - For both trackers there is a middle value where no offsets are generated. Higher values generate positive offsets for the properties and lower values generate negative ones. For the keyboard tracker (KB) this will set a middle value for a notes' pitch (e.g. C5 or B3), and for the volume tracker (VOL) this will set a middle value for a notes' volume (or velocity).

- ***Panning Offset*** *(PAN)* - Sets the offset for note panning. Turning this knob to right means panning to right for notes with higher than the middle value, and left panning for those with lower value. Turning the knob to the left generates the opposite effect.

- ***Cutoff Offset*** *(CUT)* - Sets the offset for note cutoff frequency. Turning this knob to right means higher cutoff frequency for notes with higher than the middle value and lower cutoff frequency for those with lower value. Turning the knob to the left generates the opposite effect.

- ***Resonance Offset*** *(RES)* - Sets the offset for note resonance. Turning this knob to right means more resonance for notes with higher than the middle value, and less resonance for those with lower value. Turning the knob to the left generates the opposite effect.

  The image below shows how offsets work for the sample settings in the screenshot.



Automation Clips

The Automation Clip channel is an internal controller plugin that feeds the automation tracks in the Playlist window. There you can perform advanced operations such as drawing the automation clip envelope, LFO articulation, slicing the clip and rearranging the slices to your preferences. An alternative to drawing Automation clips is the Event Editor associated with pattern block automation (known as Automation events, see page 250).

NOTE: It is **not possible to record live tweaks in an Automation clip.** Automation clip data is drawn manually in the Playlist window. To record automation data **use Automation events**, see recording automation data, page 241. This data will be saved inside patterns.

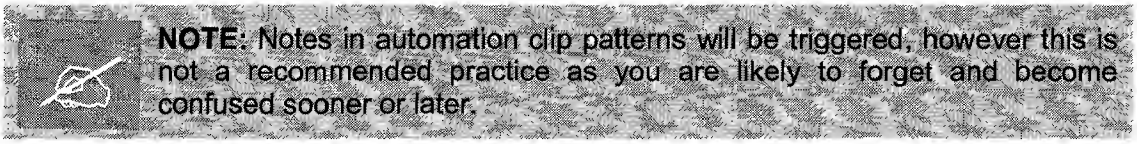
Normally, all new automation clips are inserted in the dedicated Automation Clips group (for more information on groups, see Step Sequencer page 34). It's a good practice to keep the clips in separate groups, as you will normally not use the grid or Piano Roll to trigger them.

To learn more about the settings you see when you open the channel settings of an audio clip, see Automation Clip Channel Settings.

To **learn more about using Automation clips** in the Playlist window, slicing them, creating envelopes etc., **see page 230**.

Automation Clip Settings

Automation clips are a natural way to automate parameters using spline-based graphs. The automation clips are placed directly in the dedicated tracks inside the Playlist window, and the channel that is added to the Step Sequencer is basically a placeholder for the options shown below.


NOTE: Notes in automation clip patterns will be triggered, however this is not a recommended practice as you are likely to forget and become confused sooner or later.

LFO Switch - If turned on, enables and shows a preview of the LFO and its amplitude envelope inside the clip instances placed on the Playlist tracks. It is important to remember that turning on the LFO section won't disable the 'main' envelope of the clip (although it's not visible). It will still be in effect, and you can decide how to combine it with the LFO with the Multiply switch (see below).

- ***Speed*** *(SPD)* - Sets the speed of the LFO.
- ***Tension*** *(TENS)* - Sets the LFO shape 'tension'. A shape morph that allows you to select the LFO shape, starting with square (pulse), sine, triangle and 'spikes'.
- ***Shape Skew*** - Skews the LFO shape. Together with triangle shape, the skew can be used to create saw and reversed saw LFO shapes.
- ***Pulse Width*** - Sets the pulse width of the LFO shape. Usually associated with square/pulse LFO shapes, however in this implementation it modifies all supported LFO shapes.
- ***Level*** - Sets the LFO amplitude, or strength. Select middle position to reset the level to 0, and disable the LFO. Turn to the left for negative amplitude (inverted values), or right for positive amplitude.
- ***Multiply*** - Lets you decide how to combine the LFO values with the 'main' spline envelope of the automation clip. When the switch is disabled, both values are added together. Think of this mode as LFO 'offsetting' the envelope. This is useful for bipolar parameters like panning. Enabling multiply will multiply the two values together. Think of it as the LFO being an amplitude modulator to the envelope. This is useful for unipolar properties like cutoff frequency, volume etc.

Layer

The Layer channel does not produce any sound by itself, but is used to control a set of other layers. Playing a note on a Layer channel results in playing the same note on all children of that channel. This allows you to create complex instruments with different samples and envelopes assigned to key regions, or mix the sound of several generators in one instrument controlled by a single Layer channel.

The child of a Layer channel can be any sampler channel, as well any Fruity Plugin generator, or VSTi/DXi generator, except another Layer channel.

1. Levels Adjustment

This section contains four knobs that control the volume (VOL), panning (PAN), cutoff (CUT) and resonance (RES) levels of the channel. Essentially, these duplicate the functions of other Channel Settings controls, however, they are useful for several reasons:

Easier automation – Create, for example, a fade in/out effects for a channel, using the volume adjustment knob instead of the channel volume control. This allows you to independently set the overall volume level using the channel volume knob, without needing to recreate the automation data. Similarly, use the pan adjustment knob to create panning LFO without automating the channel pan knob - so you can adjust the overall panning without recreating any automation data.

Wider range - The volume adjustment knob has a range of 0% to 200%, as opposed to the channel volume knob (0%-100%). This allows you to preamp the volume up to twice the original volume, without using additional effects for that purpose.

NOTE: The levels you set here apply ONLY to the notes played through this layer channel. If you play a child of this channel through its own Step Sequencer dots or Piano Roll, these settings will not be used in any way.

2. Layering

- ***Set Children*** - Assigns all selected channels in the Step Sequencer as children of this Layer channel. After the assignment when you play a note on the Layer channel, all the children will play along. To unassign a channel from the Layer channel, select all the channels you want to remain as children, and press the Set Children button again (all unselected channels become unassigned for this Layer channel).

- **Show Children** - Selects all channels that are children of this Layer channel in the Step Sequencer, and deselects all other channels

- **Random** - When switched off, playing a note in the Layer channels plays the same note in ALL children of that Layer channel. Turning this option on will select a random child layer and play the note on that.

TIP: You can use this feature to make more realistic drums or instruments, by assigning many similar samples to each of the children and turning 'random' on.

- ***Crossfade*** - When switched on, you can use the Fade knob to create crossfades between two channels that are children of this Layer channel. If, for example, you have 3 channels that are children of a Layer channel, as you turn the Fade knob from left to right you will hear: Child1 >> Crossfade: Child1+Child2 >> Child2 >> Crossfade: Child2+Child3 >> Child3. The first channel is considered the top channel (of those that are children for the Layer channel). The second channel is considered the first one below it, etc.

- ***Fade knob*** - Used to set the crossfade level in crossfade mode.

If you click the small arrow at the top left of this panel you can access some additional commands:

- ***Split Children*** - Splits the children of the Layer channel across the keyboard (starting with the root key of the Layer channel), assigning each layer to a single key. The root keys of the children are adjusted automatically, so they have the correct pitch when played through the Layer channel. This feature is useful for creating drum kits or instruments where each note has different sample.

- ***Group Children*** - Adds all children of the Layer channel to a group (a popup window will appear to enter the name of the group). For more information, see the Channel Filtering section in the Step Sequencer page.

3. Preview Keyboard

The preview keyboard lets you preview (left-click a key) the Layer channel sound, set the root key (right-click a key), and set a key region of the channel (drag the gray ruler to define the region).

- ***Root Key*** - The orange rectangle in the ruler above the piano keys shows the root key of the channel. Since each sample has particular pitch (except probably noise samples), FL Studio has to know how to interpret it - when you set the root key to C6, FL Studio maps pitches considering that when played at its original speed, sample has pitch of C6. All other notes are generated by changing sample's speed (and thus changing its pitch). So actually setting the root key higher makes all notes sound lower. For example, if a sample has pitch C5, and you map it to C6, FL Studio will consider that C5 sample as C6, thus shifting all notes one octave down. To set the root key right-click a key on the preview keyboard.

- ***Key Region*** - When you set the key region for a channel, all note events outside the region will be ignored (not played). This feature is not useful when using a channel by itself. However, when using a channel as a layer in a Layer channel to create complex instruments, you might want some of the layers to play only in their specified region, for example, having different sample for each octave (each sample is placed in a separate channel). Drag the ruler above the piano keys to define key region for this channel. Once created, you can edit the limits of the region by dragging its end points.

The panel above the preview keyboard contains some additional options:

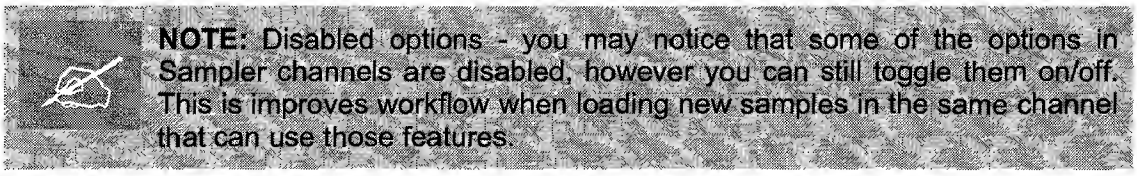
- ***Reset*** - Sets back the default base note and removes the key region (all notes will be played). For the Sampler & DrumSynth that is C5. For SimSynth, it depends on how the preset was set in SimSynth.

- ***Fine tuning*** *(FINE)* - You can use this knob to fine-tune the base note in cents. 100 cents are one semitone.

Sampler Channel

The Sampler uses a WAV or MP3 file to generate sound. It contains 4 real-time envelopes and 5 LFO-s for controlling volume, panning, pitch, cutoff and resonance of the output. For more information, see Sampler Channel Settings, and Instruments Channel Settings.

The Sampler Channel Settings page holds properties specific for the Sampler generator. It also appears in plugin generators that support custom shapes for their oscillators. In these cases, only the sample bank is visible in this tab.


NOTE: Disabled options - you may notice that some of the options in Sampler channels are disabled, however you can still toggle them on/off. This is improves workflow when loading new samples in the same channel that can use those features.

In the The Sampler Channel Settings you can turn the 'keep on disk' function on, even if the sample in question can't be kept on disk due to its format or precalculated effects. Of course, if a sample is loaded in the correct format, it will be automatically kept on disk where possible, if this option is enabled.

TIP: Conveniently, FL Studio allows the sampler to load MP3 files and convert them to a 32-bit float WAV format. If you must use MP3 samples in your projects, it is strongly recommended that you convert them to WAV files. The MP3 format is not designed for repeated conversion to and from WAV, and the quality of the sample and its timing, become degraded. Didier, the Chief Software Architect of the program, hates MP3s in project files. Use WAV, make him happy.

1. Sample Bank

The sample bank contains the wave used by the Sampler for synthesis. Left-click the button on the left side to browse a sample or SimSynth/DrumSynth preset for the sample bank. The Open dialog has been enhanced with a Favorites section. The combo box on the right displays the name of the currently selected sample. If you left-click it, a history list with recently opened samples shows.

2. Wave

Contains general wave handling routines:

- ***Keep on Disk*** - Turning this on saves memory, by streaming the sample from your hard disk, instead of loading it entirely in the memory. Note that to be able to use this option, the sample needs to be in 44100 kHz 16-bit Stereo format. Also, you cannot use pre-calculated effects (4), because they are applied to the whole wave at once.

- ***Resample*** - If your sample is not in 44100 kHz 16-bit Stereo format, re-sampling results in higher quality output. This is **not recommended for looped samples**. Since all loop points are sample aligned, re-sampling may cause 'clicks'. Note that while this option improves the real-time playback, it **requires additional CPU** and memory (re-sampled waves are larger). Also, if you use hermite curve interpolation or better in your audio or export settings, the quality of waves that have not been re-sampled won't be degraded.

- ***Load regions*** - Enabling this function will allow the loading of regions/slice markers that are available in some wav samples, and in the ZGR/REX loop files. If the loaded sample contains any regions/slices data, this option will be available (label won't be grayed out). Regions/slices are used during time stretching for more accurate sample processing (see below).

- ***Load ACID markers*** - This function, when enabled, will allow the loading of the acid beat markers for the sample if available.

3. Loop

Contains options for sample looping:

- ***Use Loop Points*** - If the sample contains loop points (see Sample view, described below), you can check this option to make the sample loop. It will playing from the beginning, and when it reaches the loop end point, will 'jump' back to the first loop point, thus creating sound with unlimited length. This is useful for instruments such as strings, organs, etc.

- ***Ping Pong Loop*** - Takes the wave between the loop markers and inserts it reversed right before the loop end marker. The audible effect is like sample 'ping-pongs' between the start and end loop points, instead of just jumping back to the start loop point.

4. Time Stretching

Time stretching allows you to pre-process samples on the fly and adjust them to your project's tempo. FL Studio's time stretching algorithms preserve pitch and aren't applied at runtime, but as a high-quality sample pre-processor run on the fly, as needed. This allows higher quality output without using CPU to process samples during playback. The only exception is that 'resample' stretching won't preserve pitch, and is very light on processor resources.

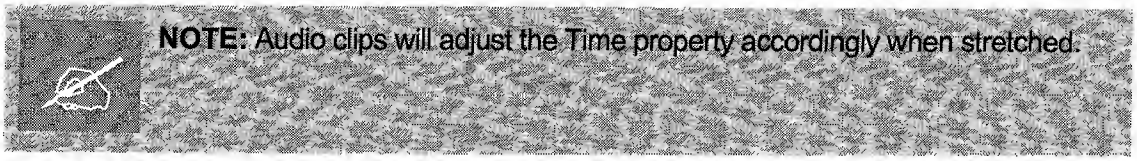
The non real-time time stretching algorithms adjust the samples to match project's base tempo. This means that if you adjust your base tempo, and there are samples which use time stretching, you will be prompted to process all samples for the new setting. Dynamic tempo changes during the song (tempo automation) can't be compensated for, so re-sampling is used to keep the time stretched samples in sync.

To disable time stretching for the sample, turn the Time knob maximum to left (set to 0). This is the default mode that won't use re-sampling during dynamic tempo changes to preserve sync.

- ***Pitch Shift*** *(PITCH)* - Allows you to shift the sample pitch while preserving its length. Since this kind of processing is not possible if the stretching method selected is 'resample', the method is automatically changed to 'auto' after tweaking this knob.

- ***Time Multiplier*** *(MUL)* - Use this knob to modify the sample length. Using the multiplier you can, for example, quickly stretch the sample to twice its length, without the need to modify the Time setting.

- ***Time Stretch*** *(TIME)* - Sets the sample length ('time') using tempo-based measures (bars, steps etc.), so that you can link the sample with the base project tempo. While adjusting the knob you can see the assigned time value in the hint bar, along with the computed 'actual' tempo FL Studio gets for the sample tempo according to the set length. If the tempo is too high or too low, you'll see a note, 'unrealistic tempo'. **Right-click menu:** the right click menu for this parameter shows some handy presets, including an auto-detect command that attempts to auto-detect the sample tempo (results may vary depending on the source material).



- ***Stretch Method*** *(combo box)* - Selects the time stretch method. Several of the methods feature the high-quality ZPlane Elastique engine that performs the processing as a pre-calculated effect as needed. **Resample** is the most basic stretching method and doesn't preserve pitch (note that the **Granulizer** allows independent manipulation of pitch and time, in 'real-time'. This is the only method that is applied at real-time during playback, so it responds to dynamic tempo changes. **Elastique (drums)** is a transient-aware algorithm, best suited to time-stretching drum loops. **Elastique (tonal)** is best used with vocals and complex audio material, such as full songs. **Elastique (slices)** auto-slices the source sample, if it has no loaded slices, and stretches it using the same algorithm found in the Fruity Slicer plugin. Slice map also performs the auto-slice step if no slices are loaded from the sample, but plays the sample without creating transitions to 'stitch' the individual slices together. This method is best used on some drum loops. **Auto** performs an automatic selection of one of the methods covered here as follows: if the sample has no loaded slices/regions: **Elastique (drums)** is used; if there are regions, and the stretch is moderate or extreme: **Elastique (slices)** is used; if there are regions loaded, and the stretch is minor: slice map is used.

5. Precomputed Effects

This is a set of non real-time effects and processing routines for the sample loaded in the sample bank. None of them requires additional CPU power to play your song, because they are all applied precomputed. FL Studio processes the sample and then it loads it in the memory with all effects already applied. However, this makes the automation of those effects impossible (see Automation, page 235). Also, applying them to streamed samples (when the Keep on Disk option is turned on) will cause the entire sample to be loaded in RAM (which is not desirable for long samples).

- ***Remove DC Offset*** - Removes any DC offset in the loaded sample. See page 199.
- ***Reverse Polarity*** - 'Flips' the waveform vertically.
- ***Normalize*** - Maximizes the sample volume without clipping.
- ***Fade Stereo*** - Creates a stereo fade from the left to the right channel of the sample.
- ***Reverse*** - Reverses the sample.
- ***Swap Stereo*** - Switches left and right channel of the loaded sample.
- ***Fade In*** *(IN)* - Applies a quick fade in to the sample (turn maximum to left to disable).

- ***Fade Out*** *(OUT)* - Applies a quick fade out to the sample (turn maximum to left to disable).

- ***Pitch bend*** *(POGO)* - Applies pitch bend to the sample. Useful for drum samples.

- ***Crossfade Loop*** *(CRF)* - Allows you to crossfade the sample for the creation of smooth loop sections (turn maximum to left to disable).

- ***Trim Threshold*** *(TRIM)* - FL Studio trims the silence in the end of the samples to free up RAM without altering the resulting sound. This control allows you to raise the volume threshold below which FL Studio detects 'silence'. Using this control you can allow FL Studio to filter very quite noise in your sample, or by setting the threshold to zero, filter only pure 'mathematical' silence.

6. Sample View

The sample view displays the loaded sample, with all precomputed effects applied. It also shows the loop points and region locations, if such exist (loop points and regions can be set by using an external wave editor). The first vertical red line is the loop start point; the second one is the loop end point. Left-clicking the sample view previews the sample (if time stretching is enabled, the preview is tempo synchronized). Right-clicking it shows a menu with additional channel settings and commands. It contains the same entries as the menu displayed by clicking the button at the top left corner of the Channel Settings window.

7. SimSynth Preset

This panel appears only when a SimSynth preset is used to fill the sample bank.

Enable the Use Riff option if you want to generate the whole riff in the preset (this option is disabled if the preset you used does not contain riff data). The Tempo knob lets you set the tempo of the generated riff.

8. DrumSynth Preset

This panel appears only when a DrumSynth preset is loaded. These parameters define the sound generated, and are identical to the same options in DrumSynth standalone.

- ***Tone*** *(TONE)* - Sets the loudness of the sine oscillator in DrumSynth.

- ***Overtone*** *(OVER)* - Sets the loudness of the second oscillator in DrumSynth.

- ***Noise*** *(NOISE)* - Sets the amount of white noise added to the sample.

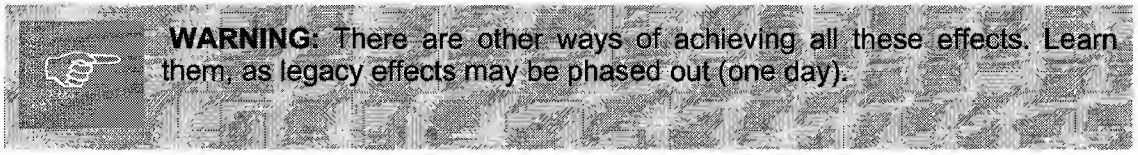
- ***Noise Band*** *(BAND)* - Sets the loudness of noise band generator in DrumSynth.

- ***Time*** *(TIME)* - Sets the length of the generated sample.

9. Legacy Precomputed Effects

This panel contains recalculation effects provided for backward compatibility with earlier versions of FL Studio. It is visible only when 'Show Legacy Precomputed Effects' is selected in Options > General Settings.

- ***Amplify*** *(AMP)* - Use to distort your sample, or amplify low volume samples.
- ***Boost*** *(FX1)* - Useful for boosting up, and overdriving your sample.
- ***Sine FX*** - Applies a sine modulation to the sample. The first knob controls the amount of modulation; the second controls the sine frequency.
- ***Cutoff & Resonance*** *(CUT & RES)* - Applies a low pass cutoff and resonance filter (for a real-time automated cutoff and resonance filter, see Instrument Channel Settings).
- ***Reverb*** - Use to add 'smooth' echoes to your sample. Two different modes of reverb are available - A & B. The knob controls the amount of reverb applied to the sound. This effect may extend your sample at the end to fit the whole reverb (it is recommended that you use the real-time reverb effect included with FL Studio - Fruity Reverb, see Effects).
- ***Stereo Delay*** *(S.DEL)* - Applies a short delay between the left and right sides of the sample, creating a pseudo-stereo effect. Turning the knob to the right slides the left channel forward, while turning it to the left slides the right channel forward. Note that this is not recommended for looped samples. Since all loop points are sample aligned, sliding either channel may cause clicks.



Audio Clips

The Audio Clip channel is a special version of the Sampler channels. Some Sampler options, such as loop points and envelopes, are not available for Audio Clip channels. If you need these functions, load the source sample into a Sampler Channel. Although you can play the sample in the Step Sequencer or the Piano Roll, the Audio Clip's main purpose is to hold song-length audio tracks and feed the audio tracks into the Playlist window, where advanced operations such as slicing the audio and rearranging the slices to your preferences are possible.

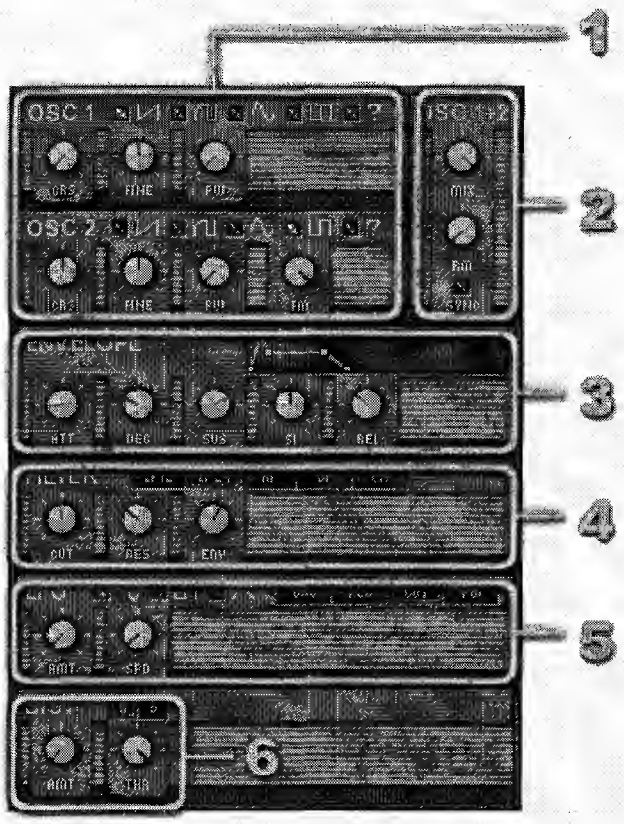
Each time you drop a new sample in the audio tracks, a new Audio Clip channel is created, and each sample placed in an Audio Clip channel becomes available in the audio tracks. Normally, all new audio clips are inserted in the dedicated Audio Clips group (for more information on groups, see Step Sequencer, page 34). It's a good practice to keep the audio clips in separate groups, as you will normally not use the grid or Piano Roll to trigger them.

NOTE: Some features supported by the standard Sampler channel are not supported by the Audio Clip channels. These include: Instrument Channel Settings, Function Channel Settings, portamento and polyphony settings and loop points. There are, however, some unique tools such as chopping available from the Audio Clip drop-down menu.

TIPS: If you want to do some destructive editing to an Audio Clip, the '**Make unique**' menu item will duplicate the Audio Clip as a completely independent channel with its own WAV file. **Slicing** with the cut tool will snap to the Playlist grid unless the local SNAP is off. To slice an audio clip with even **greater precision** and freedom, zoom the Playlist window to maximum, turn the local SNAP off, and slice away.

TS404

TS404 is a unique bass-line synthesizer that can resemble the sound of many classic synthesizers, such as TB-303, but can also create many distinctive, TS404-specific sounds. The TS404 contains two oscillators, cut/res filter, envelope, LFO and a distortion unit. For more information, see TS404 Channel Settings. If you are new to Synthesis this is a great place to start as it's relatively easy to keep track of what's going on.



1. Oscillators Section (OSC 1 & OSC 2)

An oscillator is a waveform with specific repeating pattern, filtered to create the final TS404 sound. Oscillators in TS404 have a similar function as the wave sample in the Sampler.

TS404 has two oscillators (OSC1 & OSC2). Each of them can have one of the following wave shapes - saw, rounded square, sine, square and custom (wave shape buttons are at top of each oscillator panel). Custom lets you use a short wave file as the shape of an oscillator. FL Studio comes with several sample shapes that are located in the 'TS404 Shapes' folder in the Browser. You can change the custom shape using the sample bank field in the Sampler Channels Settings.

- ***Coarse Pitch Tune*** *(CRS)* - Allows you to set the pitch of an oscillator in range of two octaves.
- ***Fine Pitch Tune*** *(FINE)* - Allows you to fine tune the pitch of an oscillator.
- ***Pulse Width*** *(PW)* – Stretches an oscillators wave shape.
- ***Frequency modulation*** *(FM)* - Applies frequency modulation to the second oscillator, based on the output from the first one.

2. Oscillators Mixer Section (OSC 1+2)

- ***Mix** (MIX)* - Determines how the outputs of OSC 1 and OSC 2 are mixed together. Left is oscillator 1, right oscillator 2. Vertical is a 50/50% mix.

- ***Ring Modulation** (RM)* - Turning this knob up adds an amount of ring modulation to the oscillators' output.

- ***Synchronize** (SYNC)* - Turning this option on will synchronize the phases of the oscillators.

3. Envelope

Applies an envelope to the filter and volume of TS404. The envelope behaves much like a standard ADSR envelope, but has some additional properties (sustain hold and gate).

- ***Attack** (ATT)* - Sets the attack value of the envelope. How fast the volume ramps up at the start of a note.

- ***Decay** (DEC)* - Sets the attack value of the envelope. How fast the volume ramps down at the end of a note.

- ***Sustain Hold** (SUS)* - Sets a period of 'holding' the sustain state before release.

- ***Sustain Level** (SL)* - Sets the sustain value of the sustain part of the envelope.

- ***Release** (REL)* - Sets the length of the release envelope.

4. Filter

- Applies cutoff and resonance filter to the TS404 sound. You can choose from among several types of cutoff and resonance filter to be applied. Filter mode buttons are located at the top of the filter panel. Resonance creates extra vibration at specific frequencies, giving a 'live' metallic sound.

- ***Cutoff** (CUT)* - Sets the cutoff value of the filter.

- ***Resonance** (RES)* - Sets the resonance value of the filter.

- ***Envelope Follow** (ENV)* - Sets the degree to which the envelope of the TS404 is applied to the resonance value.

5. LFO Section

Controls an LFO that can modulate one of the following properties: volume of the oscillators (OSC), resonance (RES), cutoff (CUT) or pulse width of the first oscillator (PW). The buttons allowing you to select what to modulate are located at the top right corner of the LFO panel. You can also select a shape for the LFO (sine, square and triangle), at the top left corner of the LFO panel.

- ***Amount*** *(AMT)* - Determine the amount of modulation applied to the altered value.
- ***Speed*** *(SPD)* - Sets the LFO frequency (speed).

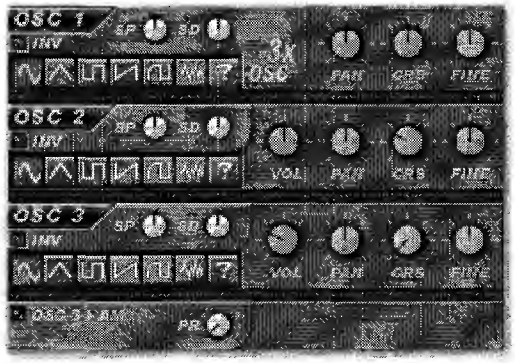
6. Distortion Section

Contains controls that allow you to add distortion to the TS404 sound. You can choose between two distortion modes (A & B buttons at the top of the distortion panel).

- ***Amount*** *(AMT)* - Sets the amount of distortion.
- ***Threshold*** *(THR)* - Selects the frequency band to be distorted. The more you turn this knob to right, the wider the band is.

3xOSC

3xOsc is a 3-oscillator, subtractive synthesizer feeding the FL Studio Sampler. Its purpose is to generate a bright sound to be filtered by the channel's instrument tools. It can also produce its own kind of stereo chorus.



To save CPU and memory, the oscillators are anti-aliased during rendering only. This means the rendered tracks may sound better, but rendering will be slower.

OSC 1, 2, 3 Parameters

This section covers parameters for all of the oscillators.

- ***Shape Selector*** - Buttons in each of the oscillators, allowing one of the following choices: since, triangle, square, saw, TB303 saw, noise, custom. Custom uses whatever sample is loaded in the channel Sampler Settings page.
- ***Invert Switch*** *(INV)* - Allows you to invert the phase of the oscillator. When you mix two oscillators with equal settings, and one of them is inverted, they cancel each other and no sound is produced. However, if you set the Fine frequency to a slightly different value, this can produce interesting flanging/phasing effects.

- ***Stereo Phase*** *(SP)* - Allows you to set different phase offset for the left and right channels of the generator. The offset results in the oscillator starting at a different point on the oscillator's shape (for e.g. start in the highest value of the sine function instead at zero point). Stereo phase offset adds to the richness and stereo panorama of the sound produced.

- ***Stereo Detune*** *(SD)* - Allows you to de-tune the stereo sound of the generator, by applying a slightly different frequency at the left and right sound channels. This adds to the stereo panorama of the sound produced, and creates a 'stereo flange' effect. When the knob is in the middle, the effect is turned off.

- ***Volume*** *(VOL)* - Sets the relative volume of each of the oscillators. Relative means that the overall sound output is kept at the same level, but the relative amount of each of the oscillators is adjustable. The first oscillator lacks this control, as at least one oscillator is always required to produce sound. For e.g., to mix 50% of oscillator 1 and 2, set the volume of oscillator at 100%. To mix all 3 oscillators at 33.33..%, set the volume knobs to 100% for oscillators 2 and 3. To mix only oscillator 1 at 100%, set all other volume levels to zero.

- ***Panning*** *(PAN)* - Sets the stereo panning of the individual oscillators.

- ***Coarse Tuning*** *(CRS)* - Sets the coarse tuning (range -24 to +24 semitones) of the individual oscillators.

- ***Fine Tuning*** *(FINE)* - Sets the fine tuning (range -1 to +1 semitone) of the individual oscillators.

- ***OSC 3 Amplitude Modulation*** *(OSC 3 > AM)* – Switch on to use Oscillator 3 as an amplitude modulation of the other 2 oscillators.

- ***Stereo Phase Randomness*** *(PR)* - Allows you to add 'randomness' to the stereo phase of all oscillators. Low values can make the sound slightly more natural, while higher values can be used as a special effect. Stereo Phasing can introduce clicks, since the oscillators start somewhere 'inside' the waveform. You can fix this by using a volume envelope with a short attack time.

BeepMap

BeepMap generates sound based on an image. Imagine a vertical line scanning an image from left to right translating (mapping) colors and brightness to frequencies, tone and volume. There you have BeepMap. BeepMap is especially good at producing atmospheric and eerie sounds, particularly when given generous amounts of ping-pong delay and reverb

Any color can be seen as a combination of red, green and blue components; and any sound can be seen as a combination of sine waves with different frequencies.

BeepMap translates red color into the amplitude of a sine wave on the left channel, and green color into a sine wave on the right channel. As a result, yellow will sound equally on both channels. The frequency of each sine wave depends on its vertical position in the bitmap. Optionally, the blue component will be used to define the frequency range per pixel.

Parameters

- ***Frequency*** *(FREQ)* - Selects the frequency range for the whole bitmap height.
- ***Length*** - Sets the duration of a pixel. The greater the length, the longer the sound will last.
- ***Linear*** - Switches between linear frequency (Hz), and pitch scale in cents (1/100 semitone).
- ***Use Blue*** - Enables blue color.
- ***Grainy*** – Causes sound to be heard as small grains.
- ***Loop*** – Allows you to loop the whole bitmap, or play it once.
- ***Max Bitmap Height*** - Sets the maximum height for loaded bitmaps, i.e. number of sine waves to be added. The amount of CPU needed to process a voice depends on that value.

Notes & Tips

There's no built-in graphic editor, so the cut/paste feature is very handy.

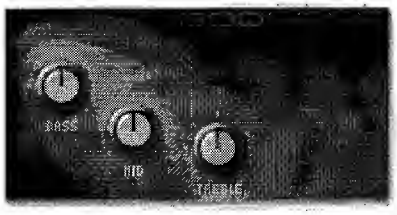
Unlike as with sample files used in a project, the bitmap is saved inside the FLP project (or FST preset), thus the file size can grow quickly.

BeepMap Credits: Didier Dambrin

BooBass

BooBass is a monophonic, realistic bass generator with adjustable frequency response and supports portamento slides. If you are reading this section because you are having trouble understanding this plugin, we suspect your video recorder is flashing '12:00'; and you stop your alarm clock ringing in the morning by shutting it in a drawer ☺

Parameters



- ***Bass*** - Lets you equalize the low (bass) frequencies of the generator.
- ***Mid*** - Lets you equalize the middle frequencies of the generator.
- ***Treble*** - Lets you equalize the high (treble) frequencies of the generator.

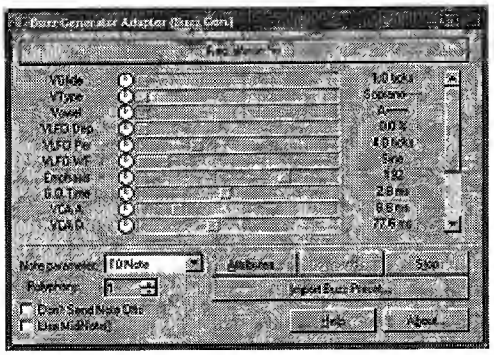
Notes & Tips

Since BooBass is monophonic, delay echoes from the channel wrapper will not work properly.

Plugin Credits: David Billen

Buzz Generator Adapter

Buzz Generator Adapter is a wrapper for Buzz generator machines. You can find a huge collection of Buzz machines at www.BuzzMachines.com. However, be warned, there are buggy ones out there, and the stability of your project may be compromised.



Parameters

- ***Note Parameter*** - Selects which parameter is used to send note messages. Not all plugins use this format for notes (but MIDI notes).
- ***Polyphony*** - Sets the polyphony of the loaded plugin. Some plugins may not use this property.
- ***Don't Send Note Offs*** - Some synths do not require note off messages, and sending such can cause problems. Use this parameter only if needed.
- **Use MidiNote** - Uses an alternative for passing notes to the plugins. Some plugins may require 'Note Parameter' instead (consult the plugin manual).
- ***Select Machine*** - Click this button to browse for a Buzz machine plugin.

- ***Parameter Sliders*** - Used to control Buzz machine parameters - exposed as normal FL Studio parameters (right-click the sliders to bring the default parameter menu of FL Studio).

- ***Attributes*** - Click this button to launch a window with additional parameters for the machine.

- ***Commands*** - Click this button to launch a menu with commands for the machine. When the machine doesn't have commands, this button is disabled.

Plugin Credits: Oskari Tammelin

Dashboard

Dashboard allows you to create software interfaces to your external MIDI hardware, such as keyboards, mixers, samplers, etc. Further, you can use the integrated automation system to record the changes as your song progresses, or set up interfaces that act as internal controllers to bring together the range of commonly tweaked knobs in one place.

Dashboard includes several pre-made panels (presets) for popular MIDI devices you can use directly in your projects. You can customize the existing panels for your own use or create new ones from scratch. This way, you can adapt Dashboard for any MIDI device you own without using plugins dedicated to a specific hardware.

How to use the Dashboard

This section covers some basics about building, modifying and employing interfaces in Dashboard.

Building or Modifying Panels

The Dashboard interfaces are made up of separate components, such as knobs, switches, sliders, and buttons. Dashboard contains a standard set of components you can employ in your projects, while advanced users can also define their own components with the Component API provided.

To modify an existing panel, or create a new one from scratch, you need to enter design mode (turn off the lock switch -). This mode allows you to create new instances of the available components, and modify their properties.

Add a New Component

To add a new component, open the menu (arrow icon button next to the lock switch), and select Add Control. You will see a submenu containing all available controls grouped by type. Select a control from one of the groups and it will appear on the grid.

Adjust the Size and Position of a Component

In design mode, you can find out if a component is selected by the presence of the 'arrow' icons (as shown).

To reposition a component, left-click on its surface and drag it to a new location on the panel.

Some of the components are also resizable, in which case you will see an additional handle at the bottom right corner of the selected control. Drag that handle to resize the control.

You can also change scale and size by directly manipulating the component properties (see the next section).

Adjust the Component Properties (Component Inspector)

In design mode, you can see an additional panel displayed on the right side of the window of the Dashboard plugin. This panel is the component inspector, that allows you to select a component for editing and modify its properties.

Select a Control - The combo box at the top of the component inspector contains a list of available components on the current Dashboard panel. Select a component from the list to select it in the panel as well, and to display its properties in the inspector.

Modify Component Properties - The inspector displays a list of properties available for the selected control, grouped by meaning. Click the + icon next to the name of each group to expand it and reveal the properties inside. You can edit the properties freely.

For more information on the specific properties for each component type, see Components & Properties.

Using Complete Panels.

As soon as the panel is locked ( ) it can be used as a standard interface as you would use in any other plugin. All rules that apply to the regular FL Studio controls, apply here as well (right-click menu, CTRL+drag for slow motion etc.).

Components & Properties

This section covers the properties available for the components (displayed in the component inspector). The properties are grouped by meaning (click the + sign to expand the group). Is a property or group is not available to a component or is exclusive to a component this is remarked after the property/group name with 'applies to' or 'exception'.

Appearance

- ***Height*** *(applies to: resizable components)* - Lets you set the component height.
- ***Width*** *(applies to: resizable components)* - Lets you set the component width.
- ***Left*** *(exception: main panel)* - Sets the horizontal position of the top left corner of a component.
- ***Top*** *(exception: main panel)* - Sets the vertical position of the top left corner of a component.
- ***Caption*** *(exception: main panel, page selectors, patch selectors)* - Sets the caption name of a component.
- ***Caption Position*** *(exception: main panel, page selectors, patch selectors)* - Sets the caption position of a component (the available choices are Left, Right, Top, Bottom).
- ***Show Caption*** *(exception: main panel, page selectors, patch selectors)* - Lets you select whether the component caption is visible.
- ***Line Width*** *(applies to: knobs)* - Sets the line width for knob components (available choices are Normal and Thick).
- ***Line Color*** *(applies to: knobs)* - Sets the line color for knob components.
- ***Pressed Color*** *(applies to: knobs)* - Sets the pressed line color for knob components (when the user is dragging the knob).
- ***Transparent*** *(applies to: components with 8-bit skins)* - Some of the components allow you to set their outer skin color transparent. This can improve the component look over some bitmap backgrounds.
- ***Font*** *(applies to: labels)* - Sets the font used for a label component.
- ***Font Color*** *(applies to: labels)* - Sets the font color used for a label component.
- ***Label Font*** *(applies to: main panel)* - Sets the font used for the caption of all components (except labels that have independent settings).

- ***Label Color*** *(applies to: main panel)* - Sets the font color used for the captions of all components (except labels that have independent settings).

- ***Page*** *(exception: page selectors, main panel)* - Appears only if you set multiple interface pages for Dashboard. Set (all) to display the component in all pages, or select a page the component is exclusive to.

Behavior

- ***Move Speed*** *(applies to: sliders, knobs)* - Sets the motion speed for sliders and knobs. The higher the number, the faster the motion.

- ***Full Range*** *(applies to: selectors)* - Selectors have a fixed number of ordered predefined items to pick from. Enabling this option lets you map the selector items with values spread over the full range of the controllers (first item: 0, last item:65536). If the option is not enabled, the range is limited by the number of items - 3 items are mapped in the range 0..2 (item1 - 0, item2 - 1, item3 - 2), 10 items are mapped in a range of 0..9 etc. The default state of this option differs for each selector type and guarantees its proper operation.

- ***FX Attack*** *(applies to: switches)* - Sets the effect 'fade in' time (the smaller the number, the faster the fade).

- ***FX Blink*** *(applies to: switches)* - Allows the control to blink with the FX Type selected on a certain event. You can select among On Press and On Over.

- ***FX Release*** *(applies to: switches)* - Sets the effect 'fade out' time (the smaller the number, the faster the fade).

- ***FX Type*** *(applies to: switches)* - Sets the effect type to be used (color of blend). If None is selected, the other FX settings have no effect.

- ***FX When*** *(applies to: switches)* - Sets the event that triggers the effect. You can select On Press or On Over (mouse events).

Controller (exception: main panel, page selectors, patch selectors).

This section sets the controller message that is transmitted by a component. That can be a MIDI message or an internal controller message. Some of the controls have a different function and the Controller group is not available to them.

- ***Controller Number*** - Sets the control number used for the messages. This parameter is not used for internal controllers and Aftertouch.

- ***Control Type*** - Sets the controller type for the messages. You can select CC, RPN, NRPN, Aftertouch, Internal Controllers.

- ***Min/Max*** - Sets the value range used by the components.

Grid (applies to: main panel)

Sets the options for the panel's snap grid.

Grid Color - Sets the grid color.

Grid Size - Sets the grid spacing (in pixels).

Snap to Grid - If set to True, the controls snap to the grid as you drag them.

Other

- ***Instruments*** *(applies to: main panel)* - Appears only if you have installed any instrument definitions (.INS) in the Artwork/Instruments folder. It allows you to select one of the definitions to be used by the patch selectors.
- ***Panel*** *(applies to: main panel)* - Lets you select a background (skin) for the panel. If you want a resizable panel, select Gray or Dark.
- ***Control*** *(exception: main panel)* - Sets the component style from the ones available.
- ***Name*** *(exception: main panel)* - Sets the component name.

Pages (applies to: main panel)

- ***Page Names*** *(applies to: main panel)* – Sets a list of page names to create multi-paged interfaces. For more information, see Page Selectors below.

Component Types

There are a range of component types, to learn more about these see the on-line help.

Plugin Credits: Frederic Vanmol

FL Keys

FL Keys is a realistic piano simulator with optimized CPU and memory usage. This plugin plays back multi-samples and is in effect a specialized sampler designed for 'keyboard' instruments.

With the help of several additional modules included in FL Studio, FL Keys can also operate as Rhodes & Roto Organ (note: additional modules might be available from www.flstudio.com).

Parameters

Sample Set

Here you can select the sample set to be used by FL Keys for synthesis. The default is Piano.

Environment

- ***Decay*** - Sets the note decay while the key is pressed. The higher the knob value, the longer time it takes for the tone to decay. You can also adjust decay to minimum to set FL Keys to sustain mode (notes do not decay). This is useful for organs and other non-decaying sounds.
- ***Release*** - Sets the release (fade out) time after the key is released.
- ***Autopan/Tremolo*** *(PAN)* - Combines two functions: ***From middle position to left***, applies between 0% and 100%, respectively, an auto-panning effect to the sound. Auto-panning speed depends on the LFO parameter in the Misc section. ***From middle position to right***, applies between 0% and 100% respectively, a tremolo effect to the sound. Tremolo speed also depends on the LFO parameter in the Misc section.
- ***Stereo*** - Sets the key to pan position ('left' piano keys are panned to left, 'right' piano keys are panned to right), with additional stereo ambience at high settings.

Misc

Overdrive - Applies a soft overdrive to the generated sound.

LFO - Sets LFO frequency used in the auto-panning and tremolo effects (see above).

Treble - A simple peaking filter that allows you to increase, or decrease, treble levels of the sound generated.

Stretch - Sets the amount of 'stretching' used for high-pitch notes (C#5 and above: the higher the note pitch, the more the stretching is applied). The knob has a range of -50 to +50 cents. Set to 0 cents (middle), to turn the effect off.

Velocity

- ***Muffle*** - Applies a subtle low pass filter to 'muffle' the sound generated. Use the linked velocity knob to determine how velocity affects muffle.
- ***Hardness*** - Adjusts the sample ranges up or down to change the virtual 'size' and brightness of the piano. Use the linked velocity knob to determine how velocity affects hardness.
- ***Sensitivity*** - Adjust the volume sensitivity of FL Keys to the note velocities. Set to minimum to make the synthesizer ignore velocities.

Tuning

- ***Tune*** - Allows you to offset the tuning of all notes from -100 to +100 cents.
- ***Detune*** - Allows you to apply a custom amount of random detuning to the pitch of the notes. Allows simulation of a Honky Tonk piano sound. Light amounts of detuning can add realism to the piano sounds. Set the Detune amount to 0 for perfect tuning (unless Stretch is used, see above).

Plugin Credits: Paul Kellett (engine), Frederic Vanmol (FL Plugin adaptation and interface).

FL Slayer

FL Slayer is a realistic electric guitar simulation originally developed by reFX. It uses a hybrid synthesis similar to physical modeling. The simulator is equipped with a high quality amp section and effects rack enabling you to recreate the complete electric guitar sound without additional plugins.

Parameters

Guitar Site Simulation Properties

Playing Mode (combo box)

This parameter controls the playing style used by Slayer:

- ***None*** - Handles notes like a standard synthesizer.
- ***Autochords*** - Creates guitar style chords based on the played notes (you can control the strum speed with the Speed knob).
- ***Powerchords*** - Creates power chords automatically based on the played notes. The keyboard is split into two sections. C5 and higher notes produce C1-G1-C2 style chords; the lower range produces C1-F1-C2 style chords (you can control the strum speed with the Speed knob).
- ***Strumming*** - Strumming is designed for individual guitar chords on live playing. Single notes are played as usual, but all chords are automatically strummed (you can control the strum speed with the Speed knob).
- ***SoloFixed*** - This is a monophonic mode, where overlapping notes create a portamento/glide effect. In this mode, the portamento speed is a constant value for all transitions and is defined by the Speed knob (speed is linked to the current tempo).
- ***SoloDynamic*** - This is a monophonic glide mode similar to SoloFixed, however the glide speed depends on the pitch difference between the start and end notes. A glide from C3 to E6 will take longer than a glide from D6 to E6. You can control the glide speed with the Speed knob (speed is linked to the current tempo).

Basic Properties

- ***Speed knob*** - Affects the strumming/gliding speed used in some of the playing modes (see above).
- ***Hold switch*** - If the hold button is on, notes are not muted after releasing a key, unlike the usual behavior (if the switch is off). You can link this parameter to your sustain pedal, so that pressing the pedal keeps the guitar strings 'vibrating'.
- ***Glissando switch*** - FL Slayer supports two sources of pitch bending (glissando). One is coarse pitch bend (+-12 semitones range), the other one is fine pitch bend (+-1 semitone range). Since there is one pitch bend knob, and Slayer needs two, Slayer includes a second pitch bend knob on its interface - Pitch Bend 2. This switch lets you select which pitch bend is the coarse: PB1 sets the regular pitch bend to the coarse range; PB2 sets the Pitch Bend 2 knob to the coarse range.
- ***Pitch Bend 2*** - A second pitch bend control for the Slayer channel. See Glissando switch above.

String Types

The string radio buttons let you select the string type used in the guitar simulation:

- ***Noise*** - The classic Karplus Strong algorithm (don't ask ☺, search it in Google).
- ***6String1/6String2/6String3*** - Best used to simulate electric guitar string sounds.
- ***Slap*** - Used to simulate the string sounds of a slap bass.
- ***EBass*** - Used to simulate the string sounds of a hard played E-bass.
- ***Fretless*** - Used to simulate the string sounds of a fretless bass.

Coil Type

Coil type lets you select the type of coil simulation used. The coil is the electronic device in the guitar that senses the string vibration and turns it into sound. If you have ever met a guitarist, they can bore you to tears going on and on about coils and what's best. Well, now you can join in that conversation too ☺:

- ***None*** - No pickup simulation is used. The sound is taken 'as is', directly from the string simulation.
- ***Single*** - Simulates the sound of a single coil pickup. You can also control how the pickup simulation sounds by moving the pickup (with mouse) to different positions. Note that you need to move the mouse up/down.

- ***Double*** - Simulates the sound of a double coil pickup. You can alsoy control how the pickup simulation sounds by moving the pickup (with mouse) to different positions. Note that you need to move the mouse up/down.

Additional Guitar Simulation Properties

- **Tone** - Sets the pitch of the formant filters to change the overall tone of the instrument.
- **Slap** - Controls the 'slap level' of the signal. The higher the note velocity, the more 'slap' occurs. If the Slap knob is set to 0 (zero), the slap effects is disabled for all velocities.
- ***Fret*** - Controls how much fret noise is mixed together with the guitar sound. You can use high settings for more aggressive pluck sounds in basses.
- ***Harmonic*** - Used to simulate the different pickup types used in electric guitars. High settings are for bright sounding pickups, low settings for darker sounding pickups.
- ***Vel*** - Sets the velocity sensitivity of Slayer. Use high settings for very dynamic sounds like slap basses. Use low settings for non-velocity sensitive sounds like power chords.
- ***Damping*** - Controls the decay time of the sound. Muted guitars use a high dampening amount.
- ***Velocity Control of Damping*** *(Vel)* - Defines how the damping reacts to velocity. High settings allow you to control the damping amount with the notes' velocity.

AMP Section

AMP Type

This radio button group selects the amplifier type used in the simulation:

- ***Dry*** - Signal is passed through EQ. No feedback, no presence. Drive knob is used as a gain control of the signal. Use this setting for unplugged sounds.
- ***Tube*** - Simulation of a three-stage valve amplifier with soft saturation. Signal is passed through presence, distortion, EQ, Speaker simulation.
- ***EQ*** - Signal is passed through EQ before it passes through 3-stage distortion. This amplifier can be the best choice for effects like Talkbox.
- ***Bandpass*** – A special amplifier. The signal moves through band passes and soft saturators in three stages. Presence, controls band pass cutoff. Finally, it goes through EQ. Try boosting low and high band of EQ for 'fat' sounds.

Cabinet Type

This radio group selects the cabinet type of cabinet used in the simulation:

- ***Dry*** - The sound you would get if the guitar is connected directly to a Hi-Fi system (linear sound, no distortion). You can use this mode for unplugged sounds.
- ***British*** - Simulates a British Cabinet. Use for aggressive sounds.
- ***Combo*** - A combo box simulation. Use for softer sounds.
- ***StaX*** - Very aggressive cabinet with a big boost on high frequencies. Use for heavy metal style sounds.

Additional Amplifier Properties

- ***Drive*** - Controls the level of distortion.
- ***Presence*** - A simple high–shelf filter that adds or removes brightness to the sound.
- ***Feedback*** - Amount of feedback that is returned from the output of the amplifier simulation back to the site

Simulation.

- ***Low*** - Controls the bass level below 200 Hz.
- ***Mid*** - Controls the mid level around 1000 Hz.
- ***High*** - Controls high frequencies above 2.5 KHz.
- ***MFX-90*** **Effects Unit Properties**

The effects unit contains a combo box that selects the effect type and two additional knobs which sets parameters specific for each effect type.

Effect Type

Allow you to selects from two general effect types: AMP - a pedal effect applied before the amplifier; MST - a master effect that is applied after the amplifier;

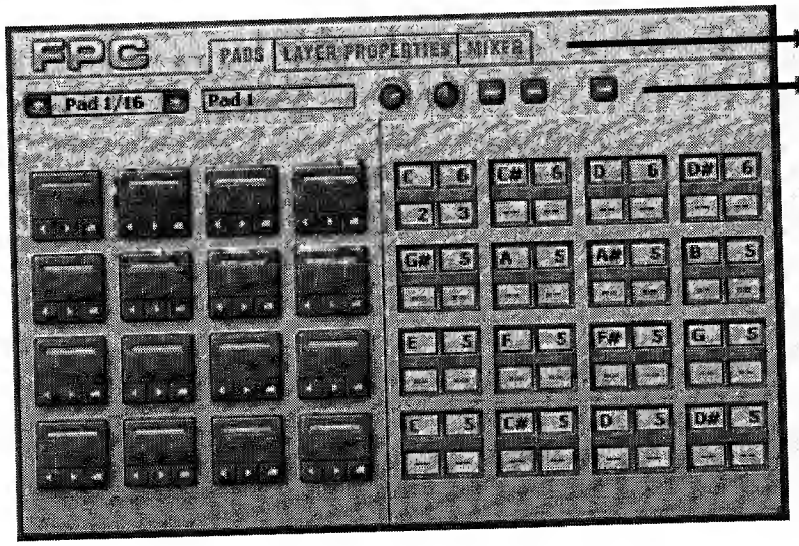
- ***Dry*** - No effect is applied.
- *AMP:* ***Phaser*** - The signal is modulated & mixed with dry signal to create a phasing effect. The first parameter controls the LFO speed for modulation. The second one is the feedback level.

- *AMP:* ***Tremolo*** - AMP type tremolo effect. It automatically retriggers on new notes and syncs with the song tempo. The first parameter controls LFO speed, while the second controls modulation depth.
- *AMP:* ***WahWah*** - A low-pass filter with resonance and an envelope follower. The first parameter controls the attack speed, the second controls the modulation depth.
- *AMP:* ***WahWah*** *LFO* - A WahWah with LFO. The first parameter controls the LFO speed, the second, modulation depth. The LFO automatically syncs with the played notes.
- *AMP:* ***Ringmod*** - Ring-modulation that automatically tunes harmonic with the played notes. Parameter 1 controls the harmonic for the modulator.
- *AMP:* ***Fuzz Box*** - Signal-shaper for adding grunge to the signal. Please use this effect carefully since it adds a high amount of harmonics to the signal. Parameter 1 controls Fuzz Box drive. The second parameter adds digital distortion.
- *AMP:* ***Harmonizer*** - This effect adds harmonics one octave below and one octave above the current played note. Parameter 1 controls the mix level for the upper harmonics, parameter 2 the mix level for the lower harmonics. This effect only works well on single notes (avoid it with chords).
- *AMP:* ***Talkbox*** - Simulates human-voice formants. Parameter 1 selects the LFO modulation speed; parameter 2 selects the formant pitch. This effect often sounds better with coil simulation set to 'none' (see above).
- *MST:* ***Chorus*** - Smooth stereo chorus. The first parameter controls LFO modulation speed, the second, modulation depth.
- *MST:* ***Flanger*** - Flanger with feedback. The first parameter controls LFO modulation speed, the second, modulation depth.
- *MST:* ***Phaser*** - Stereo phaser. The first parameter controls the LFO speed for modulation, the second, feedback level.
- *MST:* ***Leslie*** - The popular 'leslie' effect known from Hammond Organs, originally created by a speaker rotating around a microphone. The first parameter controls rotation speed, the second, modulation depth.
- *MST:* ***Tremolo*** - Creates tremolo effect. First parameter controls LFO speed, the second, modulation depth. It automatically re-triggers on new notes and syncs with song tempo.
- *MST:* ***DubDelay*** - A simple left-right delay for adding some spatial depth to the sound. Parameter 1 controls delay time.
- *MST:* ***Multitap*** - A stereo-tap-delay with filter. The first parameter controls delay time, the second, feedback. It automatically syncs with the song tempo.

Plugin Credits: reFX (engine), Frederic Vanmol (FL Plugin adaptation & interface)

FPC - FL Pad Controller

FPC is a software plugin similar to the hardware Akai MPC unit, coded & optimized for the FL Studio platform. FPC is a self-contained multi-layer/velocity drum machine which makes it easy to create, edit and swap drum kits, or parts of kits, on the fly, in order to tune the sound of the drumloops in your project. FPC supports 16 multi-layered patches per drum kit bank. There is a **Video Tutorial** for the FPC available at - **http://www.flstudio.com/video?FPC**



The interface is separated into three panels. You can display these using the tabs on top of the window. In the first tab you can see the main pad properties that shows/sets the properties of the currently selected pad (explained below).

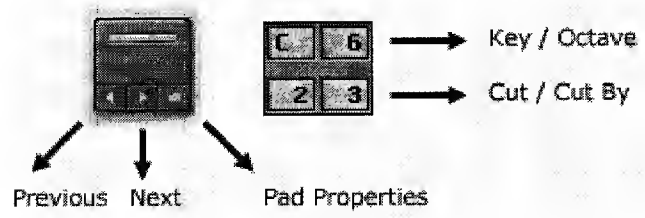
Main pad properties

The parameters affect the currently selected pad and appear in the first two tabs of the FPC interface.

- ***Pad selector*** -(left) Lets you change the selected pad.
- ***Pad name box*** - Shows the pad name, which you can change by right-clicking the box and entering new name in the window that will pop up.
- ***Pan and volume*** - Sets the pad volume (left), and stereo panning (right).
- ***Mute knob*** - Active when lit up (green), mutes the current pad. The solo knob is active when red, mutes all other pads except the current pad (and any other solo pads).

- ***Sale volume knob*** - Allows you to map input note velocities to pad volume. Normally, this option should be enabled, unless you want to handle velocity changes entirely with multiple velocity-sensitive layers (see Layer Properties below).

Pads View



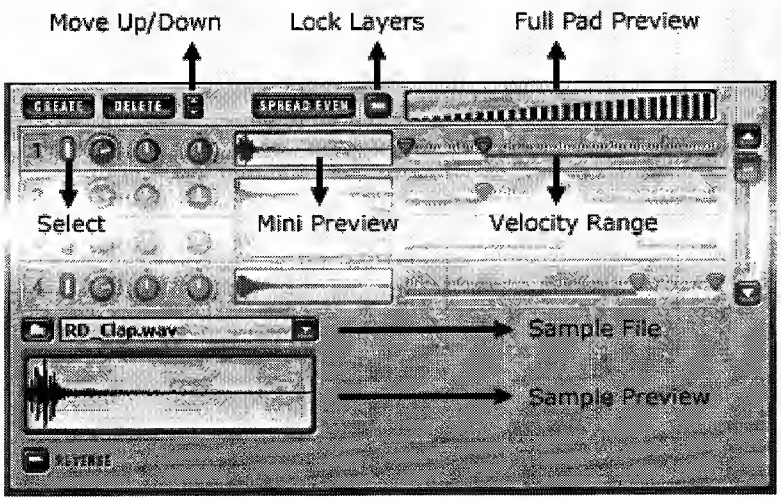
The Pads view lets you quickly preview a pad, or set its key/cut groups.

The pad controls are ordered from left to right, and then bottom to top (i.e. pad 1 is bottom left, pad 16 is top right). To select and preview a pad, click the big preview button on each of the pad button on right (see the image on right). To just select without previewing, click the Pad Properties button. The Previous and Next buttons allow you to switch between several alternative versions of that pad. Each drum kit may (or may not) include several samples for each pad to switch between.

At the right, you can see a set of controls (following the same order), containing four boxes for each pad. Change the value by dragging up or down. The first row sets the key the pad is assigned to. The left box sets the key inside the octave, while the right sets the octave.

The second row sets the cut groups for the pad. The cut groups are identical in functionality to those found in the Misc Channel Settings section of regular Sampler channels (and other plugins). Using these groups you can 'kill' a pad which plays (like an open hi-hat) when another pad is triggered (like a closed hi-hat). To do this, set the pad to cut to a certain cut group (the box on left), then set the pad to be cut with the same cut group in the cut by group box (on right).

Layer Properties View



Each pad in FPC can consist of multiple samples, layered in such a way that each sample responds to a specific note velocity range. This can be important for achieving realism with acoustic drum kits.

The Layer Properties view allows you to create and edit the layers of the currently selected pad.

Basic Operations

- ***Create button*** - (top left in the window) adds a new empty layer to the pad. To erase it, select it (hit the Select knob of the layer) and click the Delete button.
- ***Browse button*** - Once added, you can load a sample to the layer by clicking the Browse button (the button on left in the Sample File controls below) and selecting a sample.
- ***Reverse*** - You can reverse a sample's playback by enabling the Reverse option at the bottom.
- **Up/Down buttons** - To reorder the channels, select a channel and use the Move Up/Down buttons on top of the interface.
- ***Spread Even button*** - Spreads the velocity ranges evenly among the existing layers without overlap (see layer properties below).
- ***The Lock Layers button*** - Locks the layer ranges in a way to prevent velocity range overlap (one sample will play at a time for any given velocity).

To preview how the pad will sound with different velocities with all layers applied to it, click the Full Pad Preview at the velocity value you want to preview.

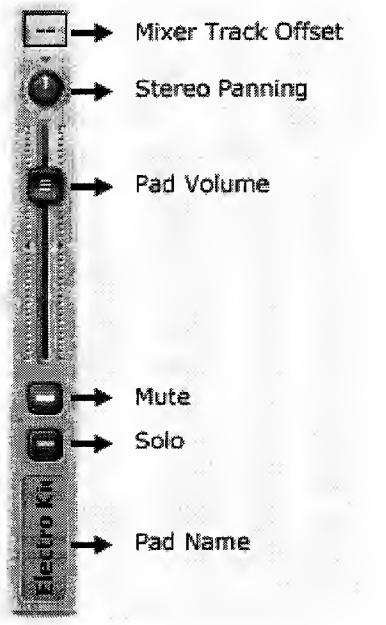
Layer Properties

The controls on each layer are (from left to right):

- ***Select Button*** - Click this button to mark the channel as selected. This is required for some operations, like browsing for a new sample, move up/down, delete, display in the big sample preview (in the bottom) and the reverse playback switch.
- ***Volume Knob*** - Sets the volume of the layer.
- ***Pan Knob*** - Sets the stereo panning for the layer.
- ***Layer Tune Knob*** - Allows you to offset the pitch up/down (faster/slower playback) from the original playback speed of the sample. The knob ranges from -1 to +1 octave pitch shift.
- ***Mini Sample Preview*** - Displays the loaded sample (if any). Click to preview the sample.
- ***Velocity Range*** - This control sets the active velocity range for the layer, i.e. for which velocity values the sample will play (for the rest it is muted). The velocity is mapped from left (minimum) to right (maximum). Drag the handles to define the active region. Overlapping of several samples in the same range is allowed, unless the Lock Layers button (see above) is enabled.

Mixer View

The mixer view duplicates the properties found in the Main Pad Properties & adds the mixer track offset property. Since all pads are displayed at once in a single view, it is easier to adjust many pads at once. Each mixer 'strip' (column) corresponds to a single pad, ordered from left (pad 1) to right (pad16). The controls found on each strip are as follows (from top to bottom):



- ***Mixer Track Offset*** - This property allows you to send a specific pad to a different FL Studio mixer track than the one FPC is linked to. The parameter specifies a positive offset, for e.g if FPC is linked to track 10, then all pads are sent to track 10, however you can set offset 4 for pad16, so that it will be sent to track 14 instead. By default, all pads are mixed in the default mixer track (the control displays '-- ').
- ***Stereo Panning / Volume / Mute / Solo*** - Those properties are identical to those found in the main pad properties section, however the volume is a slider for easier contro).
- ***Pad Name*** - Displays the channel name. Again, like in the main pad properties, you can right-click this box and fill a new name for the pad in the window that appears.

Plugin Credits: Robert Conde

Fruit Kick

Fruit Kick is a simple kick drum synthesizer. A kick drum sound is synthesized by taking a simple waveform, sine wave, with a fast opening volume envelope and a quickly falling initial pitch. This generator allows you get to experiment with those parameters.

Continued...

Parameters

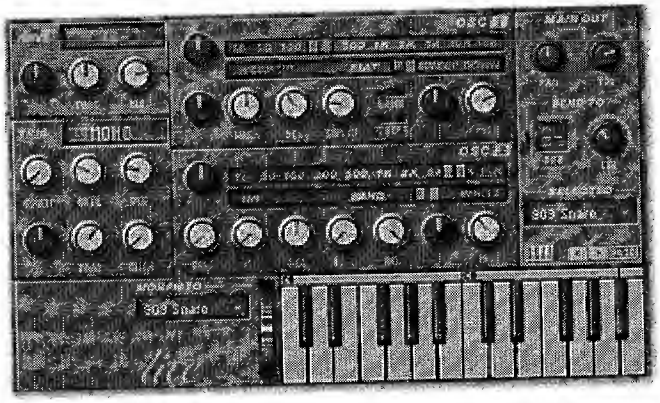
- ***Start sweep frequency*** *(MAX)* - Defines the start frequency of the kick sound.
- ***End frequency*** *(MIN)* - Defines the 'sweep to' (end) frequency.
- ***Sweep time*** *(DEC)* - Defines the pitch sweep time (i.e. pitch decay).
- ***Amplitude decay*** *(A. DEC)* - The amplitude (volume) decay length.
- ***Click*** *(CLICK)* - Adds phase offset to the kick sound to produce a click. Turn right for louder click.
- ***Distort*** *(DIST)* - Applies hard clipping to the sine wave oscillator for 'punchier' kick sounds.

Plugin Credits: Didier Dambrin

Fruity DrumSynth Live

DrumSynth DrumSynth Live is the FL Studio plugin version of the popular DrumSynth standalone created by Maxim Digital Audio. DrumSynth Live features simultaneous support for 120 real-time programmable drum patches, each assigned to a separate key (C0 to B9). You can morph dynamically from one drum patch to another - just select the patch to morph to and tweak the morph amount knob.

The sound is created by two noise generators, filtered by bandpass filters with an incredible range - you can set anything from single frequency (sine wave) to full white noise. The first oscillator can also act as swept frequency sine wave generator for creating kick drums and tom sounds. The second oscillator has more advanced envelope: adjustable attack length and envelope mapping shape (from logarithmic to linear), useful for snare drums and hi-hats. The envelope re-trigger controls allow for quick creation of clap sounds and can be also used for harder attack in the drum sounds.



Velocity to Property (Black) Knobs

Some properties can be changed to suit the note velocity. Such controls have a velocity mapping knob on their left (all the big black knobs in the interface). If a velocity knob is turned to right, higher note velocities increase the property value. Turn left to lower the property value with velocity increase instead.

Parameters

Testing Keyboard

The testing keyboard has two functions - it lets you test the drum patches and select a drum patch for editing: just left-click a note, the orange rectangle shows the currently edited patch. There is also a right-click menu which allows you to copy and paste the patch settings from one key to another.

You can reset a patch to one of the default sounds in the preset. Right-click a note and select an entry from the 'Set to default patch' submenu. The default patch for the current key is displayed in bold.

The keyboard displays two octaves simultaneously. You can scroll the keyboard to see the required range using the scroll button above the keyboard: . If the AUTO option is enabled, the keyboard will auto-scroll to display the proper range as notes are played.

Wave Panel

DrumSynth Live can mix recorded drum samples with the noise generator. In this section you can set the wave properties and mix amount.

- ***90***
- ***Wave Selector*** - Select one of several high-quality drum/percussion samples to be mixed with the white noise generator.
- ***Sample Tuning*** *(TUNE)* - Sample pitch (transpose).
- ***Mix Amount*** *(MIX)* - Turn right to mix more of the wave sample and less of the noise in the oscillators.

Oscillator 1 (OSC 1)

- ***Frequency slider*** - Center frequency for the bandpass filter/sweep tone.

- ***Sweep Up/Down slider*** - Frequency offset to sweep from. Slide right to sweep from higher frequency, slide left to sweep from lower frequency. Appears only when using the oscillator in sweep tone mode (see below: Sweep Tone/Noise switch).

- ***Bandwidth slider*** - Sets the bandwidth of the bandpass filter. You can set anything from single frequency bandwidth (turn left) to full white noise (turn right). Appears only when using the oscillator in noise mode (see below: Sweep Tone/Noise switch).

- ***Harmonics knob*** *(HARM)* - Applies waveshaping distortion to the oscillator (turning to the left applies odd harmonics, turning to the right applies even harmonics).

- ***Envelope Decay knob*** *(DEC)* - Sets the envelope decay for the oscillator. Turn right for slower decay.

- ***Sweep Time knob*** *(SWEEP)* - Sets the sweep speed. Turn to right for longer sweep time. Applies only when using the oscillator in sweep tone mode (see below: Sweep Tone/Noise switch).

- ***Noise/Sweep Tone switch*** *(NOISE)* - When turned on, the oscillator operates in noise mode: white noise processed with a bandpass filter. When turned off, the oscillator operates in sweep tone mode: a sine wave that can sweep from higher or lower frequencies with adjustable sweep time, useful for toms, kicks and various effects.

- ***Invert Phase switch*** *(INVERT)* - Inverts the phase of the oscillator. Useful for fixing situations where the two oscillators might phase each other.

- ***Output Level knob*** *(MIX)* - The output volume of the oscillator. Higher output levels produce hard clipping useful for rim-shot sounds and similar effects.

Oscillator 2 (OSC2)

- ***Frequency slider*** - Center frequency of the bandpass filter.

- ***Bandwidth slider*** - Bandwidth of the bandpass filter. You can set anything from single frequency bandwidth (turn left) to full white noise (turn right).

- ***Osc1 to Osc2 Rind Modulation*** *(RING)* - Ring modulates Oscillator1 with Oscillator2.

- ***Envelope Attack knob*** *(ATT)* - Envelope attack time (fade in) for the oscillator. Turn right for slower attack.

- ***Envelope Decay knob*** *(DEC)* - Envelope decay (fade out) for the oscillator. Turn right for slower decay.

- ***Envelope Shape knob*** - Changes the envelope shape from logarithmic (turn left) to linear (turn right).

- ***Envelope Release knob*** *(REL)* - Envelope release length of the oscillators (affects both the OSC1 and OSC2).

- ***Output Level knob*** *(MIX)* - The output volume of the oscillator. Higher output levels produce hard clipping useful for rim-shot sounds and similar effects.

Trigger Settings (TRIG)

Contains misc. patch settings and controls for envelope re-triggering.

- ***Voice Mode select*** - Voice mode for the current drum patch. The possible voice modes are: Mono - each trigger of this patch cuts the previous; Poly - polyphonic model, no voices are cut; Group 1/2/3/4 - four global (for the channel only) cut groups. If you select a group, each patch will cut itself and also cut any other patches with the same group setting.

- ***Count knob*** *(COUNT)* - Number of envelope re-triggers to occur when playing the patch. Turn right for more re-triggers.

- ***Rate knob*** *(RATE)* - Time between each trigger (turn right for slower trigger rate).

- ***Trigger Decay knob*** *(DEC)* - Decay (fade out) speed for each trigger (turn right for slower decay).

- ***Tone Filter knob*** *(TONE)* - Turn left to apply lowpass filter to the patch sound, turn right to use highpass filter.

- ***Click Amount*** *(WAVE)* - Phase offset for the oscillators. The phase offset can be used add 'click' effect to the patch. Turn max to right for random phase offset on each patch triggering.

Morph Controls (MORPH TO)

You can morph the settings of any patch to the settings of another patch.

- ***Morph To list*** - Shows a list of patches to morph to. The morphing uses the current settings of the patch you select, not the default settings.

- ***Morph Amount knob*** - Turn up to morph to the patch selected in the Morph To list.

Output Settings

- ***MAIN OUT****: Panning knob (PAN)* - Panning of the current patch.

- ***MAIN OUT****: Volume knob (VOL)* - Volume of the current patch.

- ***SEND TO****: Send Track LCD (NUM)* - Selects the send effects track to send the patch output to.

- ***SEND TO**: Send Level knob (LVL)* - Send amount (volume) of the current patch.
- ***Patches list*** - Shows the currently edited patch. Click the combo box to select another patch.
- ***Hide/Show Keyboard switch*** - Shows/hides the testing keyboard and morphing controls.

TIP: Most properties of DrumSynth are read once for each triggered voice (drum note), so changing the properties of an already running voice has no effect. A DrumSynth preset saves the entire drumkit, i.e. saves all 'drum notes' at once in single preset. If you are new to drum synthesis, why not master Fruity Kick first then move onto DrumSynth Live.

Plugin Credits: Paul Kellett (engine), Frederic Vanmol (conversion), Didier Dambrin (interface)

Fruity DX10

Fruity DX10 comes as a demo version in FL Studio and needs to be purchased separately in order to save projects containing Fruity DX10 channels.

Fruity DX10 is 8-voice polyphonic FM synth (Frequency Modulation) and is designed for high quality (low aliasing) sound and low processor usage. This plugin is an enhanced version of Paul Kellett's DX10 FM synth. FM synthesis involves modulating the pitch of one oscillator (waveform) with the pitch of another. If this is done quickly enough, rather than hearing a rising and falling pitch, you hear a new 'tone'. FM created a sensation in the mid 80's when it enabled sounds like realistic bells, piano and acoustic bass to be synthesized for the first time.

Click the piano icon at the top right corner of the interface to show/hide the keyboard in Fruity DX10's interface.

Parameters

- ***Wave Brightness*** *(WAVE)* - Turning the knob to the right adds brightness to the generated sound.
- ***Octave Shift*** *(COARSE)* - Use this knob to shift the octaves of the synth.
- ***Vibrato LFO Rate*** *(LFO RATE)* - Sets the speed of the vibrato effect.
- ***Vibrato Amount*** *(VIB)* - Sets the vibrato amplitude amount (vibrato strength).

Amplitude Section

Contains controls to set the volume envelope of the sound

- ***Envelope Attack*** *(ATT)* - Sets the attack (fade in) length of the synth.
- ***Envelope Decay*** *(DEC)* - Sets the decay (fade out) length of the synth.
- ***Envelope Release*** *(REL)* - Sets the release (fade out after key is released) length of the synth.

Modulation Sections

- ***Coarse Tune*** *(COARSE)* - Use to set the modulation speed (pitch).
- ***Fine Tune*** *(COARSE)* - Use to fine tune the modulation speed (pitch).
- ***Modulation Velocity*** *(VEL.SENS)* - Sets the velocity of the modulation.
- ***Pass Though*** *(THRU)* - Turn to the right to mix the modulation wave with the output (apart from modulation of the signal). This control is available only for the first modulator.
- ***Amplitude Init*** *(INIT)* - The start amplitude of the modulation.
- ***Amplitude Time*** *(TIME)* - Time needed for the modulation amplitude to reach the sustain level (see below).
- ***Amplitude Sustain*** *(SUS)* - The sustain amplitude of modulation.
- ***Amplitude Release*** *(REL)* - The time needed for the modulation amplitude to reach zero after key release.

Plugin Credits: Paul Kellett (original code), Frederic Vanmol (conversion), Didier Dambrin (interface)

Fruity Granulizer

Fruity Granulizer is a generator plugin that utilizes the granular synthesis technology. The source material for the Granulizer is a wave sample loaded by the user.

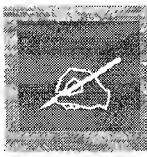
Granular synths split a wave sample into many small pieces ('grains'), which are then played back according to the settings of the generator. The length and spacing of the grains can also be altered to achieve different effects.

Granular synthesis can be used to stretch a wave without altering its pitch and vice versa. It can be used to create lots of complex special effects. Since all of the parameters are automatable, you can even start with normal playback and then 'morph' to some kind of effect.

Parameters

Grains Section

- ***Attack knob*** *(ATT)* - Sets the attack and decay length of each grain (i.e. fade in/fade out time). The time is added (twice - fade in and fade out) to the length of the grain.
- ***Grain Hold knob*** *(HOLD)* - Specifies the length of each grain.
- **Grain Spacing knob** (G.SP) - Controls the grain spacing in playback. Turn to right for greater spacing between played grains (slower playback). Turn to left for smaller spacing (faster playback).
- ***Wave Spacing knob*** *(W.SP)* - This parameter controls the amount of grains generated from the wave sample. This value ranges from -300 to 300%. Smaller values mean more grains generated for the wave (smaller wave spacing). Using negative values for this property results in reversed playback of the grains (note that it is the grain playback order that's reversed, not the sound contained in each separate grain).
- ***Sample Start knob*** *(START)* - This knob sets the position in the sample used when playing starts. When turned maximum to left, the sample starts playing from the beginning. Turn the knob to right to start playing offset inside the sample.



NOTE: To achieve normal sample playback, set both **Grain Spacing** and the **Wave Spacing** to 100%.

Effects Section

- ***Stereo Separation knob*** *(PAN)* - The more you turn it to right, the more even grains are panned to right, and odd ones panned to left. To disable the effect, turn the knob maximum to left.
- ***Effect Depth knob*** *(FX.D)* - This setting determines the amplitude of the LFO applied to the wave spacing value. Turn to right to increase the amplitude. To turn the LFO off, turn the knob maximum to left.
- ***Effect Speed knob*** *(FX.S)* - This knob determines the speed of the LFO applied to the wave spacing value. Turning to right makes the LFO faster, while turning it to left makes it slower.
- ***Randomness knob*** *(RAND)* - Applies randomness to grain playback. Turn the knob to right to increase the effect. To disable the effect, turn it maximum to left.

Transients Section

The Granulizer plugin is aware of transients (either auto detected or processed from the sample if slices were loaded). When a grain crosses a transient, it is aligned to it, and is set a new user-defined length. This gives better quality when stretching certain material, like drum-loops.

- ***Hold*** - Sets the length or transient grains.
- ***Switch*** - OFF: Transients are disabled; USE REGIONS: Uses the slices loaded from the sample, if any; DETECT - Auto detects transients, even if slice/region info is available in the sample.

Time Section

- ***Loop switch*** - When turned on, the wave loops.
- **Hold switch** - While pressed, the playing position won't change. It has the same effect as if the wave spacing setting is set to 0% for a moment.
- ***Key To*** - Maps keys to several different properties: Key to pitch: maps keys to pitch (default); Key to percent: keys from C5 to C7 correspond to 0%-100% start position for the sample. For example, to start the sample from the middle, trigger C6 key; Key to step: keys C5 & above offset the sample start with a step (C6 offsets 12 steps, C7 - 24 etc.); Key to transient: keys C5 & above trigger the sample starting from a specific slice.

NOTES: Time stretching in the Sampler Settings has a special meaning for this generator. The sample will be stretched according to the settings leaving the sample pitch unaltered. This works because the pitch of the sample is determined by the speed at which the Granulizer loops around the grain (sample slice) it is processing, and the duration is determined by the rate at which that 'window' is moved through the sample.

Plugin Credits: Didier Dambrin.

Fruity Keyboard Controller

The Fruity Keyboard Controller is an automation control and makes no sound of its own. You can use this plugin to control knob and sliders through out FL Studio. This is achieved by mapping note pitch and velocity fed to the keyboard controller from the piano roll or step sequencer to any automatable parameter within FL Studio and 3rd party plugins.

For example, this plugin allows you to quickly implement Pattern Controlled Filtering (PCF), or accurate semitone-to-semitone slides for plugins which do not support natively such features (VSTi and DXi plugins).

The Keyboard Controller exports the following internal controllers:

- ***Kb Ctrl*** - *Note* - The value of this controller depends on value assigned to each key via the Value for the Current Key. The default setting maps the active range of notes so higher pitched notes will output larger values for automation and lower pitched notes smaller automation values (see below). Run your mouse up and down the upper keyboard (shown above) and observe the value of the left most knob.
- ***Kb Ctrl*** - *Velocity* - The value of this controller depends on the velocity of the triggered notes.

TIP: You can use this generator to open and close the cutoff value of a filter to create gating effects driven by piano-roll rhythms, step-sequencer or live MIDI playing.

Mapping controls

- ***Mapping Drop-Down Menu*** - Click the button with the arrow icon to access the automatic mapping menu. You can map the controller values from 0 (min) to 1 (max) gradually though the entire currently selected region (see Keyboard View below). You can select to map only white keys or white and black keys.
- ***Current Note Display*** - The LCD shows the currently selected note in the Keyboard View (see below).
- ***Value for the Current Key*** - The knob next to the LCD sets the value of the Kb Ctrl - Note controller for the current note. This parameter does not affect the Kb Ctrl - Velocity controller which uses the note velocity.
- ***Release Switch*** - Turn this option on to set the Note controller to another value on key release.
- ***Release Value*** - The knob next to the release switch sets the value used after key release (only if the switch is turned on). The value is global for all keys.
- ***Smoothing*** *(Envelope Speed)* - Sets the attack ('fade in') and release ('fade out') time of the controller. Increase the value of this property to create smoother transitions between the different values of the controller.

Keyboard View

The keyboard view is very similar to the preview keyboard you can see at the bottom of those channel settings pages: Function Settings; Misc Settings; Instrument Settings; Plugin Settings. It is used to show the current key and set a range for auto-mapping.

- ***Current Key*** - The orange rectangle in the ruler above the keyboard view shows the currently edited key for the controller. Left-click any key to set it as a current key.
- ***Key Region*** - Defines the area that is used during auto-mapping. The first note in the region is set to the minimum value (0), while that last is set to the maximum value (1). The rest of the keys in the region are a transition between those two values. You can set the limits of the region by dragging its end points.

Notes & Tips

Mapping the keyboard controller to the pitch bend controller of native FL Studio synth properly (transposing), requires a range of 8 octaves + 1 semitone. The proper mapping is also present like a preset for the Keyboard Controller: To pitch bend (transposing).

If you need to map different range (+-12 semitones range for standard VSTi synths), remember to auto-map both black *and* white keys.

Plugin Credits: Didier Dambrin.

Fruity Slicer

Fruity Slicer uses beat detection algorithms to automatically slice up a wave file into pieces and then makes the slices accessible via the Piano Roll. This process is particularly useful with percussion loops. If the loaded loop contains slices/regions they will be recognized and used instead of auto-detecting them.

Fruity Slicer offers playback and reordering of the individual slices and time-stretching capabilities optimized for drum loops.

Parameters

- ***BMP / BEATS controls*** - Sets the tempo (speed) and beats (length) the original loop is expected to be. Those settings are automatically set to the correct values if such information if embedded in the loop, otherwise Slicer will try to guess the loop tempo and length (the longer the loop, the less accurate the detection may be).

- ***Open sliced beat groove button*** ( ) - Lets you import groove files (.ZGR) created by BeatSlicer/BeatCreator. Note that the groove files do not contain the sample data, so if the Fruity Slicer doesn't find the corresponding wave file it will ask for the sample location as well.

- ***Open and slice up a sample button*** ( ) - This button allows you to open a sample file (.WAV, Recycle .REX / .RCY / .RX2 etc.) and have it sliced up automatically.

- ***Open beat slicer button*** ( ) - Lets you select the method used to slice the loaded loop:

- ***Use Sample Built-In Slicing*** - Uses the slices loaded from the sample (if any). This is the best option as long as the loop is sliced properly.

- ***Dull / Medium / Sharp Auto-slicing*** - Those three options perform auto-slicing of the loop with three predefined values for the slice thresholds (see the threshold knobs explained below). The slicing performed is rough/normal/fine respectively.

- **1/6 Beat, 1/4 Beat** ... Beat - Slices with the given measure regardless of the content (i.e. no slice auto detection).

- ***None*** - The whole loop is treated as a single slice.

- ***Zero cross check slices*** - If you hear click/pop artefacts while playing the slices, you can call this option after slicing the loop with any of the options above. This will snap the slice markers to the nearest zero crossing.

- ***Open BeatSlicer*** - This sends the current sample and groove file (if it exists) to the registered beat slicer (e.g. BeatSlicer or BeatCreator) for further slice editing and refinement. After exporting the new groove file in your beat slicer, you need to reload the groove into the generator ( ).

- ***Dump beat to piano roll button*** ( ) - Allows you to 'dump' the beat to the Piano Roll (uses a time selection, if any) by writing a sequence of notes in it (each of them corresponding to a single slice). Click to see a list of available 'dump' presets:

- ***Normal*** - Writes the notes to match the beat length (adjusted to current tempo).

- ***Reverse*** - As normal, however the sequence is reversed (each individual slice is still played forward).

- ***Random*** - Each slice is placed on random location while preserving the loop groove and length. The sequence will be different with every call to the command.

- ***Flatten*** *(groove)* - The loop groove is preserved (slice locations) however all slice locations are played with the first slice.

- ***Shift Up / Shift Down*** - The groove is preserved but all slices are shifter up/down with one slice.

- **Quantize / Swing** – Quantize with 'swing' timing.

- ***Accentuate Beat*** - The first slice in each beat (beat as a measurement) is assigned a higher velocity.

- ***Pitch Up Beat*** - Every slice which belongs in an odd beat (1-st, 3-rd etc.) is assigned a higher pitch.

- ***Widen Stereo*** - The panning alternates between medium left and right panning for every next slice.

- ***Crazy*** - The pan, pitch and velocity values of every slice are randomized (every time the values will be different).

- ***Stutter*** *(half)* / *Stutter Half* - Each slice is broken into two pieces (half) or four pieces (quarter) to create a 'stuttering' effect.

- ***Original Length*** - Dumps the slices to the piano roll to match the loop's original speed (at the current tempo).

- ***Pitch Shift slider*** *(PS)* - Allows you to offset the pitch of all slices, up or down (middle position = original pitch).

- ***Fill Gaps slider*** *(FILL GAPS)* - Stretches the end of the slices to remove any gaps (when playing the sequence slower for example). The middle position means no stretch. You can match the stretching perfectly to the current project tempo if you right-click and select Auto detect.

- ***Auto Dump switch*** - When enabled, Fruity Slicer will dump the sliced beat automatically after loading and when adjusting the loop's tempo/length.

- ***Auto-fit switch*** - If enabled, the loaded loop will the adjusted to fit to the current project tempo on load.

- ***Play to End*** - When enabled, each slice plays to the end of the loop.

- ***DeClick*** - Applies very small fade in/out amounts to the slices, only to remove click/pop artifacts.

- ***Attack slider*** *(ATT)* - Applies a fade in effect to the slices. Push the slider to the bottom to turn off that effect.

- ***Decay slider*** *(DEC)* - Applies a fade out effect to the slices. Push the slider to the bottom to turn off that effect.

Slices Preview screen

Shows the sample and the generated/imported groove (where each slice is separated from the rest with vertical red lines). If you hold your mouse over a slice in this area, the hint panel in FL Studio will show the corresponding note that triggers it in the Piano Roll and the Step Sequencer. Click a slice to play it and select it for editing in the Slice Properties view

Slice Properties view

Above the Slicer Preview screen you can see the selected slice and some of its properties.

You can click 'REVERSE' to reverse that slice (every time the slice is played it will be reversed)

Click the drum name to select a name for the slice. The name is displayed in this plugin and in the Piano Roll (when 'names' mode is selected).

Click the key value to assign this slice to a different key.

Slice Thresholds

These knobs (found at the bottom of the interface) define the low and high thresholds used during auto-slicing (slice detection) of the loaded loop. Keep in mind that tweaking any of those options will cancel your previous setting (for e.g. use built-in slices, or slice per 1/2 beat, etc.) and switch to auto-slicing with thresholds based on those knobs.

Notes & Tips

The tempo of any (correctly sliced up) loaded loop will be adjusted automatically to the tempo of your song. As you can access any of the slices in the loop in the Piano Roll you can easily rearrange the loop in any way. You can apply an effect (pitch, volume etc) to each slice in the loop in the Piano Roll.

Be picky about the slicing. If the slice markers aren't positioned perfectly or if a slice marker is missing, don't hesitate to press open the loop in BeatSlicer ( ) and fine tune the slice markers in BeatSlicer/BeatCreator. We can assure you that it will be well worth the small effort.

Plugin Credits: Didier Dambrin (Slicer plugin), Peter Segerdahl (BeatSlicer engine)

Fruity Soundfont Player

The Fruity **Soundfont Player** comes as a demo version in FL Studio and needs to be purchased separately in order to save projects containing Soundfont Player channels.

The Fruity SoundFont Player is an advanced sampler which can load SoundFont2 instruments, drumkits, or collections. This plugin uses the LiveSynth SF2 rendering engine. SoundFonts are an excellent way of replicating acoustic instruments such as string or brass sections.

Parameters

- ***Load SoundFont*** - This button is located in the top left corner of the interface. Click it and select a SoundFont2 instruments/drumkits bank file to load (.SF2).

- ***Edit SoundFont*** - This button is located in the top right corner of the interface. Click it to open the current SoundFont bank in a SoundFont editor, to edit to instrument definitions. The first time you run this feature, the SoundFont player will ask you to browse and select a SoundFont Editor to be used for this button. If you have a Creative™ sound card you may be able to use the Vienna SoundFont editor (search for it on Google).

- ***Patch LCD*** - Set the patch (instrument) number in the SoundFont collection to be played by the generator.
- ***Bank LCD*** - Set the bank number in the SoundFont collection to be used by the generator.
- ***Name*** - Shows the name of the selected instrument. Click this area to see a full list with instruments/drumkits available in the currently loaded SoundFont collection.

TIP: The bank and patch LEDs can be automated. You can also place your mouse pointer just on the upper and lower edge of these LEDs to increment and decrement by one unit on each click (this is true for most LED displays in FL Studio). When you are in the correct position, a single arrow-head will appear.

Reverb & Chorus Section

This section gives you the ability to use a set of Fruity/VST/DX effects on a send track as a reverb/chorus effect for the SoundFont player instead of generator's internal reverb/chorus effect (generally with lower quality).

NOTE: It is wise to avoid using the built-in FX, and use FX from the mixer instead. The **built-in FX can cause CPU overload** problems with Pentium processors (demoralization).

- ***Send To LCD*** - Select the send track number to use for reverb/chorus send effect.
- ***Send Amount knob*** - Use this knob to add more or less reverb/chorus to the instruments (it multiplies the reverb amount for each instrument, so instruments with no reverb will remain with no reverb).
- ***Use Built-in*** - If you turn on this option, the SoundFont player will use its built-in reverb/chorus effect instead of using FL Studio's send track.

Envelope2 Section

Use this section to override the volume envelope settings used in the SoundFont instrument. The four sliders represent the Attack (A), Decay (D), Sustain (S), Release (R) levels of the SoundFont envelope. Keep these slider maximum to down to disable overriding of the predefined values.

LFO2 Section

Use this section to override the pitch LFO settings used in the SoundFont instrument. The three knobs represent the Predelay (DEL), Amplitude (AMT), Speed (SPD) levels of the SoundFont LFO. Keep these knobs turned maximum to left to disable overriding of the predefined values.

Misc Section

- ***Send Amount knob*** - You can use this knob to override the cutoff level used in the SoundFont instrument. Keep the knob turned maximum to left to disable overriding of the predefined cutoff levels.
- ***Modulation*** - Turn this knob to right to add modulation to the instrument.
- ***HQ Rendering*** - Turn this switch on to get higher quality rendering.

Plugin credits: Didier Dambrin (interface, conversion), LiveUpdate (LiveSynth SF2 engine)

Fruity Vibrator

Fruity Vibrator adds vibes to your songs using any force feedback device present on your PC.

The plugin loads & maps .ffe effect files across the keyboard, & plays them back (with velocity).

Such .ffe effect files can be created using the Microsoft Force Editor tool (fedit.exe) that can be found in the DirectX Developer SDK. The DirectX Developer SDK is here: www.microsoft.com/directx/

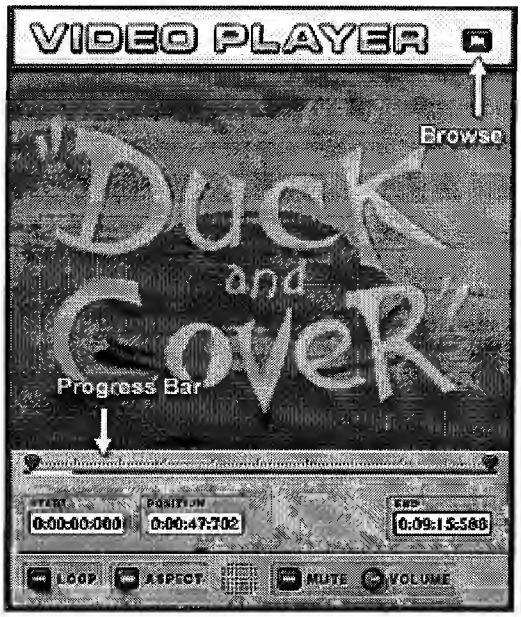
Notes & Tips

For the best timing accuracy, the Enable MIDI output option in FL Studio must be switched on. Force Feedback devices might take some time to warm up when playing effects, so you may have to trigger them a little ahead in order to have them synchronized with the music.

Plugin Credits: Didier Dambrin, Frederic Vanmol

Fruity Video Player

Fruity Video Player allows you to open and play video files synchronized with your song. This is a very useful tool for those who are working on music soundtracks that need to be scored in time with video events.



Keep in mind that FL Studio will not export the video you load, and the plugin can be used only for playback purposes. The audio from the video (assuming it has audio) is streamed into FL Studio and can be routed to any mixer channel, however if you need to mix the original video audio track with your music it is highly recommended to export the audio as wave file and then import it as an audio track inside FL Studio. This will ensure the highest quality synchronization and sound quality.

Parameters

- ***Browse Button*** - Click this button to browse and open a video file in the player.

NOTE: The Video Player works with windows native formats (.WMV, .AVI etc). If you have a video in a format not recognized by the Video Player it should be convert it to one of these formats first. The .MOV format is one common example. The QuickTime™ movie viewer can be unlocked (for a small fee) to convert between .MOV and the .AVI format that Windows can use.

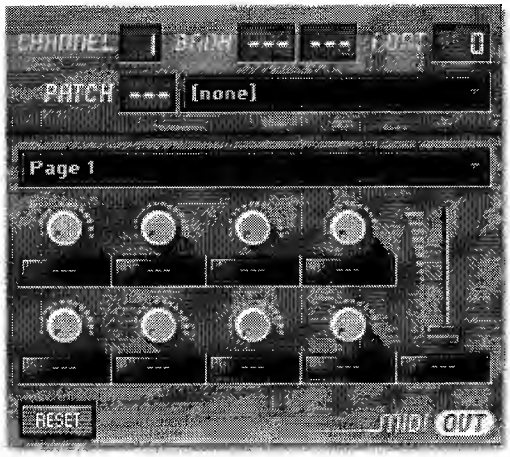
- ***Progress Bar*** - Shows the playback position of the video (the lit up section of the bar) and allows you to limit the video segment to be played from both sides (see the black handles over the progress bar).
- ***Loop*** - If the video is shorter than the project you're working on, enabling this option will loop the video to fill the entire length of the project.
- ***Aspect*** - Enable this option to preserve the original aspect ratio of the movie as you resize the window. Disabling it will fit the video perfectly in the window but may stretch it to an incorrect aspect ratio.
- ***Mute*** - Enable this option to mute the video completely (no audio streamed in FL Studio).
- ***Volume*** - Sets the volume of the audio track inside the video.

TIP: After rendering your soundtrack you will need to combine it with the original video. Windows XP ships with a very nice (**free**) program called 'Windows Movie Maker'. This is a great place to start if you are new to video editing.

Plugin credits: Duncan Fewkes, Frederic Vanmol

MIDI Out

MIDI Out is a powerful MIDI output plugin, supporting eight pages of nine freely assignable controllers each.



Parameters

- ***Channel*** - The MIDI output channel number. Generally channel #10 is the drum channel.
- ***Bank*** - The patch bank number (MSB & LSB).
- ***Patch*** - The patch (instrument) number. This parameter is automated. The combo box displays the name of the general MIDI instrument for the selected patch number. It may not match the current instrument if your device is not using a general MIDI mapping. For some devices, the patch number also selects the drum kit for drum channels.
- ***Reset*** - Sends a reset (CC #121) message to your MIDI device, then updates all enabled controls. This switch is handy when you have disabled a control and you want its assigned controller to be reset by the MIDI device.
- ***Page*** - The current controller page (right click to rename). Each page supports nine freely assignable controllers (all automatable).
- ***Controller Knob*** - Each knob represents a single controller. The unassigned knobs in each page are labeled with three dashes (---). Click the label to enable/disable the corresponding controller (all controllers are disabled by default). Right click a control to configure it (controller assignment, range etc.).

Notes & Tips

Pan, filter cutoff & resonance per note (by the graph edit or the piano roll) is not supported - the MIDI standard only supports velocity per note.

As there is no standard rule for mapping velocity values (0..127) to dB, the level scale of MIDI channels may not fit the internal mixer levels.

Plugin Credits: Didier Dambrin

Plucked!

Plucked! in an example of physical modelling, where mathematical formula are used to simulate real sound producing objects, like a plucked string, for example. Plucked implements a 'Karplus-Strong' plucked string model. The curious may search for it on Google - however, be prepared for some Math ☺

Parameters

- ***Normalize*** - Tries to make the decay the same for all semitones. Otherwise higher notes have a shorter decay.
- ***Gate*** - Stops the voices abruptly when released. Otherwise the decay keeps going.
- ***Widen*** - Enhances the stereo width of the sound.

Notes & Tips

Pitch bends are not supported for this generator.

The Piano Roll allows an offset on the decay & color per voice. While slides can be used to change the decay on the fly, the color works at trigger time only (i.e. they don't change as the voice is running).

Plugin Credits: Didier Dambrin, Perry Cook (physical modelling).

ReWired

ReWired allows you to host any compatible ReWire™ device in FL Studio, including sample accurate streaming audio input, synchronized transport and playback controls and MIDI data receive/transmit.

ReWire™ is a technology by Propellerhead™ Software, which enables various instruments and sequencers to connect to each other and share common audio and transport functionality, with sample accuracy.

FL Studio now adds support for both client and host mode to support the widest range of existing ReWire™ applications. The following pages describe how FL Studio implements ReWire™ and contain step-by-step guides how to use ReWire™ to connect FL Studio with Cubase™ SX, Sonar 2 (client mode), ReBirth™ and Reason™ (host mode).

NOTE: There is a section dedicated to Rewired in a later Chapter, pp 280. You can also link FL Studio in client mode as a VSTi or DXi synth.

Plugin Credits: Frederic Vanmol

SimSynth Live

SimSynth Live is the FL Studio plugin version of the widely popular SimSynth standalone created by David Billen.

SimSynth Live is modelled after the classic analogue synthesizers of the 80s, and is capable of producing a wide range of instruments and effects: from strings and pads to deep bass lines.

The sound is created by three oscillators, filtered by an SVF (State Variable Filter) section, and amplified by an ADSR envelope. The unit includes a programmable LFO section that

can control some of the parameters in the oscillator and SVF sections. Finally, you can filter the sound with a chorus effect to widen the stereo panorama of the patch.

Parameters

Oscillators Section (OSC1, OSC2, OSC3)

- ***Oscillator ON/OFF*** *switch* - Each oscillator has a checkbox on its left that can be used to turn it on/off. An orange light indicates the oscillator is turned on.

- ***Oscillator Waveshape selector*** - The selector is placed on the top of each oscillator. You can use it to select the wave shape used for synthesis: Pulse/Square – This produces a bright tone sounds. The pulse width can be adjusted with the PW knob (and can also achieve square oscillator shape); Saw – Produces bright tone sounds yet with different harmonics than Pulse/Square; Triangle – Produces dark tone sounds; Noise – Produces random white noise. The frequency range of the noise can be adjusted using the Frq knob where zero is white noise (full spectrum); Sine – This produces a very dark and pure tone. The sine can be varied from standard to the 4th power using the PW knob.

- ***Pulse Width knob*** *(PW)* – Adjusts the pulse width of the Pulse wave shape. This varies the harmonic content of the oscillator (technically it varies it from odd harmonics to all harmonics). It also affects the Sine wave shape - from standard sine to 4^{th} power of sine.

- ***Frequency knob*** *(CRS)* – Offsets the frequency of the oscillator in semitones. Has a two octave range, from –12 to +12.

- ***Fine Frequency*** *(FINE)* – Offsets the frequency of the oscillator in cents, (1/100-th's of a semitone). Has a two semitone range, from –100 to +100.

- ***Level knob*** *(LVL)* – Sets the output level (volume) of the oscillator from 0 to 100%.

- ***LFO Modulation knob*** *(LFO)* – Specifies the amount of frequency modulation from the LFO unit. Has a two octave range, from –100 to +100%. Note that in order for the LFO to modulate around a tuned frequency, the CRS and/or FINE knobs must be adjusted to compensate for the variation.

- ***Envelope Modulation knob*** *(ENV)* - Specifies the amount of frequency modulation from the Amplitude Envelope. Has a two octave range, from –100% to +100%.

- ***Mix One Octave switch*** *(1)* – Mixes additional wave in the oscillator (one octave higher). Adds an octave to the oscillator. Best used with the sine and triangular wave shapes.

- ***Mix Two Octaves switch*** *(2)* – Mixes additional wave in the oscillator (two octaves higher). Best used with the sine wave shape.

- ***Warm Oscillator switch*** *(WARM)* – Softens the oscillator sound by mixing a second wave with slightly detuned frequency (without variation).

- ***Rind Modulation switch*** *(Ring 1x2)* – Ring modulates Oscillator 1 by Oscillator 2. This produces a 'harsh' sound that was expensive with the older analogue synths.

Filter Section (SVF)

- ***Filter Envelope Attack knob*** *(ATT)* - Amount of time required for the envelope to go from zero to full when a new note is played.

- ***Filter Envelope Decay knob*** *(DEC)* – Amount of time required for the envelope to fall from full to the sustain level after the attack.

- ***Filter Envelope Sustain knob*** *(SUS)* – Level at which the filter envelope will sustain as long as a note is held.

- ***Filter Envelope Release knob*** *(REL)* – Amount of time required for the envelope to fall from the sustain level to zero after the note is released, or through being held.

- ***Envelope to Filter knob*** *(ENV)* - Amount of modulation of the filter envelope over the filter cutoff value (negative or positive). This amount is added to the existing cutoff value.

- ***LFO Modulation knob*** *(LFO)* - Amount of modulation of the LFO over the cutoff value (negative or positive). This amount is added to the existing cutoff value. Important: You must turn on the LFO unit first for this knob to have any affect.

- ***KB to Cutoff knob*** *(KB)* – Amount of modulation of the note pitch over the cutoff value.

- ***Track Amp switch*** *(TRACK AMP)* - Disables the filter envelope, and enables the Amplitude Envelope. The ENV knob then controls the modulation of the Amplitude Envelope over the cutoff level. This makes editing easier when creating presets with identical filter and amp envelopes.

- ***Cut Off Frequency knob*** *(CUT)* – Base cutoff frequency of the filter, from 0 to 100%.

- ***Filter Emphasis knob*** *(EMPH)* – Also called resonance and Q. Emphasizes the frequencies near the cutoff. A little emphasis is useful for general purpose synthesis. A lot of emphasis sounds highly electronic and is useful for techno or special effects (together with cutoff frequency variations).

- ***High Pass Frequency knob*** *(HIGH)* – Sets the high pass frequency of the filter. Note that this knob reduces low pass output as high pass output is increased. Set to 50% to produce a notch filter.

- ***Band Pass Frequency knob*** *(BAND)* – Sets the band pass frequency of the filter. Note that this knob reduces low pass (or high pass as specified by the high knob), as band pass output is increased.

Amplitude Envelope (AMP)

- ***Amplitude Envelope Attack knob*** *(ATT)* - Amount of time required for the envelope to go from zero to full when a new note is played.

- ***Amplitude Envelope Decay knob*** *(DEC)* – Amount of time required for the envelope to fall from full to the sustain level after the attack.

- ***Amplitude Envelope Sustain knob*** *(SUS)* – Level at which the filter envelope will sustain as long as a note is held.

- ***Amplitude Envelope Release knob*** *(REL)* – Amount of time required for the envelope to fall from the sustain level to zero after the note is released, or through being held.

- ***Volume knob*** *(LVL)* – Overall volume of the audio output of SimSynth.

Low Frequency Oscillator Section (LFO)

- ***LFO Waveshape selector*** - The selector is placed on the top of the LFO section. You can use it to select the shape used for oscillation: Square – Alternates between the max and min values; Saw – Falls gradually down to the min value then switches to max again; Triangle – Alternates gradually between the max and min values; Noise – Produces random values.

- ***LFO Rate knob*** *(RATE)* - LFO speed.

- ***LFO Delay knob*** *(DEL)* - Aamount of time required for the LFO to take affect after a note starts. It can be seen as fade in or attack time for the LFO.

- ***LFO retrigger switch*** *(RETRIGGER)* - When selected, the LFO starts at zero when a note is played. Also, the delay (see above) begins with each note. When unselected, the LFO cycles continually for all notes.

Chorus Switch

- ***Chorus switch*** *(CHORUS)* - When turned on, applies a chorus effect to sound. The chorus widens the stereo output by slightly delaying and modulating the frequency of the sound. It usually adds a nice, stereo touch to any preset. However, it can cause a side effect called 'phase cancellation' which might not be desired. **Phase cancellation might cause problems with bass sounds, especially if they are mixed to mono and played through a subwoofer.**

Plugin Credits: David Billen (engine), Frederic Vanmol (conversion), Didier Dambrin (interface)

Sytrus

If you want to dive straight in, there is a Sytrus tutorial on page 170.

Sytrus is a powerful and versatile synthesizer featuring six customizable operators for FM (Frequency Modulation) and RM (Ring Modulation) synthesis, plucked string synthesis, 3 SVF (filter) & distortion modules, effects module with chorus effects and three delay lines and unique programmable unison mode.

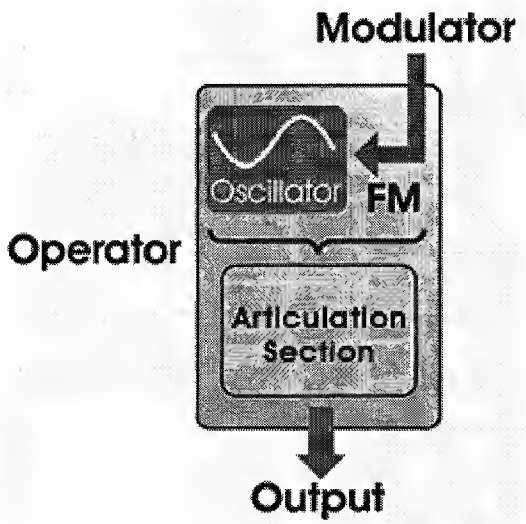
The rich implementation characteristics of Sytrus allow for an extremely wide range of sounds, including bass lines, bells, pads, drums, pianos, strings, organs and even entire drum and synth loops (in a single patch/note), made possible by the completely customizable envelopes supported by each module.

Along with this flexibility comes complexity. However, if you stick with Sytrus, and read this section thoroughly, we are sure you will find this one of the most rewarding plugins in the FL Studio stable.

Sytrus - Basics of FM Synthesis & the Modulation Matrix

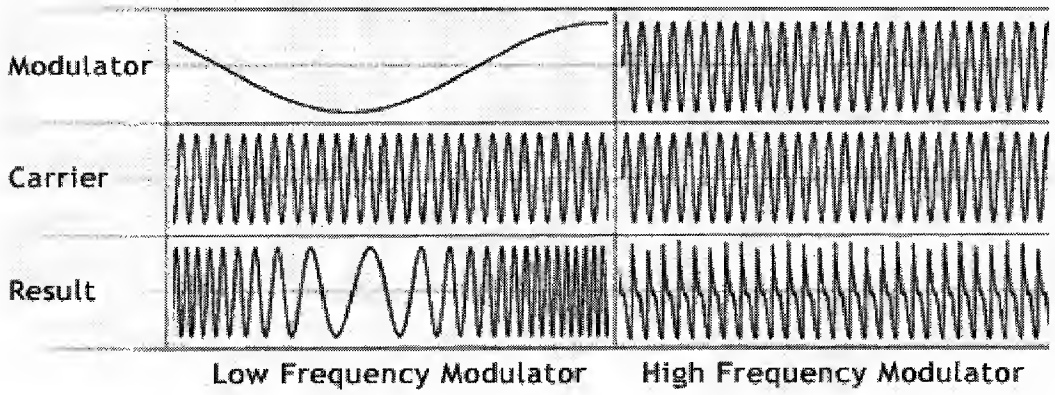
Basics of FM Synthesis

Most of today's software synthesizers use subtraction synthesis. A spectrum-rich oscillator (saw, square, triangle etc.) is processed with a low-pass, band-pass, or high-pass resonant filter to produce the final sound. FM (Frequency Modulation) uses another approach: additive synthesis. Pure tones (sine waves) are mixed and processed in a such way that additional harmonics are created and added to the signal to produce the final sound. Unlike sub-synths, the basic module of the FM synth is called an 'operator'. An operator includes a pure tone oscillator (sine wave) and an articulation section (at the basic level the articulation section is at least a simple ADSR volume envelope):



FM Synthesizers contain two or more operators (Sytrus supports six). When an operator is connected to the input of another (see the modulator input diagram), a pitch (frequency) modulation occurs. The modulating operator is called 'modulator' while the modulated operator is called 'carrier' (in Sytrus a single operator can act both as a carrier and modulator):

If the modulator has an extremely low frequency (as in the example on the left), the result is simply a vibrato effect on the carrier. High modulating frequencies however produce complex, rich sounds. This arrangement defines how each operator interacts with the those linked in the matrix and defines the FM synthesis algorithm. In Sytrus, the creation of an algorithm is made easy with this modulation matrix interface (see Modulation Matrix below).



Sytrus Implementation

Sytrus offers everything found in classic FM synthesizers and supports six operators, and a modulation matrix, where you can define the synthesis algorithm. Sytrus also includes a set of advanced features which allow you to create many unique sounds:

- ***Custom Oscillator Shape*** - The oscillator shape of each operator can be tweaked in various ways, such as adding harmonics, morphing to other shapes than sine (square, triangle), pulse width, add noise etc. An operator can also be set to generate plucked string tones with fully customizable damping envelope, which can be indispensable for string and pads patches.

- ***Ring Modulation*** - Sytrus operators can interact not only via FM (frequency modulation) and a simple mix, but also via RM (ring modulation). Ring Modulation is a process where the spectra of two input signals are multiplied together to produce another spectrum, often having characteristics qualitatively different than the input signals.

- ***Support for Subtractive Synthesis*** - Sytrus includes three full-featured SVF (filter) modules which can be used to filter the operators' output. By combining both additive (FM/RM) and subtractive (SVF) synthesis techniques into a single product, Sytrus is extremely flexible and can produce a wide range of sounds without additional plugins and processing.

- ***Effects Module*** - Offers a range of effects to touch-up the patch sound, including three delay lines (which can process in parallel or in serial mode) and a high-quality chorus effect to add depth to your Sytrus patches. Additionally, the signal from the effects module can be sent to a mixer send track for additional processing.

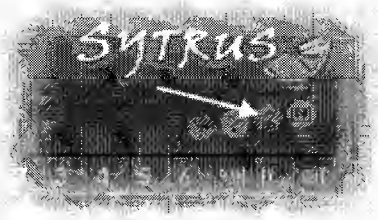
- ***Fully Customizable Articulation*** - The mapping diagrams, LFO and envelopes in Sytrus extend far beyond the simple ADSR volume envelope support. Each diagram and envelope state can be comprised of unlimited number of curve segments, and allow you to control pitch, volume, panning, velocity mapping, unison settings etc., thus allowing complex patch structure, including even programming whole drum and synth loops into a single patch/voice.

- ***Programmable Unison Mode*** - Supports sub-level voices, variable pitch, pan, volume and envelope variation. Uniquely, each property which can be targeted in the articulation sections of the modules can be mapped by the patch creator to the unison voices following 100% customizable mapping graphs, which allows practically every voice in the unison to have different properties (for more information, see the main module).

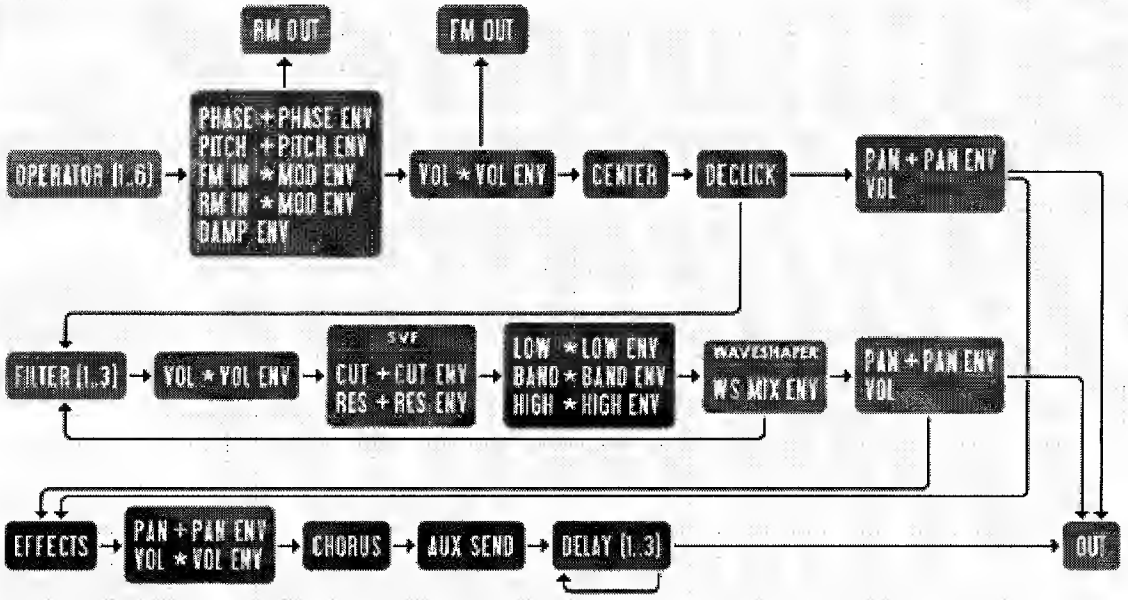
NOTE: If you intend to create your own Sytrus patches or modify the existing ones, it is recommended to check the Sytrus processing diagram. It describes in detail how the Sytrus modules are processed and mixed.

Sytrus synthesis flow chart

Click here on the Sytrus front panel

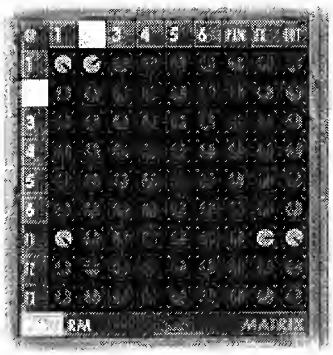


to show the following diagram -



Modulation Matrix

The modulation matrix of Sytrus is where you set up the FM synthesis algorithm. Additionally, the matrix contains the necessary controls to adjust the operator send levels to the effects and filter modules, panning and 'dry' output level.



Each knob controls a certain function or mapping or relationship (explained below).

Active

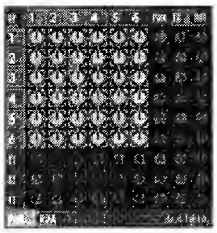
Inactive ("muted")

The neutral position for each knob is the middle (Alt + left click to reset a knob to its neutral position). You can also right-click a knob for a quick mute/unmute while preserving the knob value (this feature is useful while you are testing and tuning a patch):

The matrix comprises of several discrete parts. Below we take a deeper look into each section and explain its usage:

Modulation Setup

The FM/RM section sets up the modulation algorithm of Sytrus.

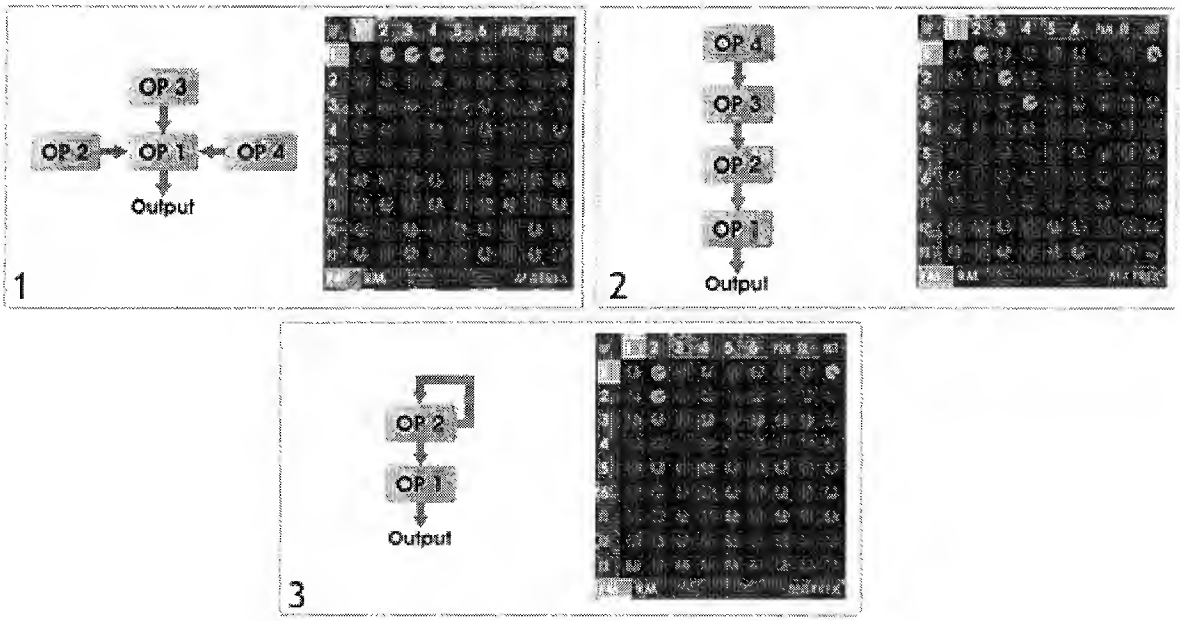


Each row represents an operator and sets up which operators modulate it and how much. The knobs determine the amount of modulation, where if the value set is negative (turn the knob on left) the modulation phase will be inverted. At the neutral level (Alt + left click a knob) no modulation occurs.

It is not required for an operator to be modulated to produce output.

TIP: If you are unsure of the purpose of a knob in the matrix, simply hover over it with the mouse and check out the FL Studio hint bar.

Here are few very basic algorithms, and their representation in the Sytrus matrix:



In these examples, operator 1 is used as a carrier and the rest of the active operators are modulators. You can modulate an operator by itself (in example 3, row 2, column 2 - modulating operator 2 by itself), thus creating a feedback effect.

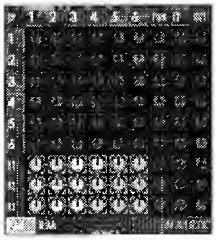
Notice that the carrier must be assigned an output, either a direct (as in the examples) or via the filter modules. For more information on the filters and output assignment, check the other two matrix sections covered below.

Sytrus also supports RM (ring modulation) interaction between the operators. To see, and adjust the RM setup, click the FM/RM switch at the bottom of the matrix:

Please keep in mind the switch only affects the modulation setup section of the matrix, as the rest of the settings (pan, FX send, filter send etc.) are shared among the FM/RM setups.

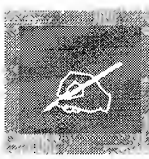
Filter Send Levels

This section adjusts the amount of signal sent from each operator to the filter modules. Negative values will send inverted signal to the filter modules.



Sytrus includes thee filter modules, and each row in the section represents one of them. If you want to send 50% of the operator 3 and 4 output to filter section 2, adjust the knobs as follow: in row F2 (filter section 2), adjust the knob in column 3 (operator 3) to 50%; in the same row adjust the knob in column 4 (operator 4) to 50%.

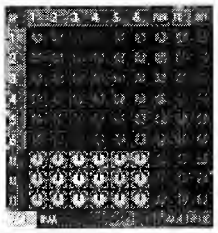
To reset a knob to a neutral position, hold Alt and left-click it.



NOTE: To hear the output of the filter sections, they need to be assigned an output. To learn more about this check the Pan, FX Send and Output section covered below.

Pan, FX Send and Output

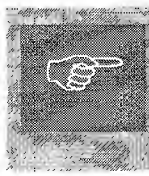
In this matrix section you can define the panning, effects send amount, and output amount for each of the operators and the three filter sections.



The first column sets the panning of its corresponding module (operator or filter). The default position is centered.

The second column defines the amount of signal sent to the effects module. If you set this knob to a negative value, the signal sent to the effects module will be inverted. The default neutral position (middle) sends no signal to the effects module.

The third column defines the output amount for its corresponding module (operator or filter). Negative value sends inverted signal to the output.



IMPORTANT: Neither the operators, nor the filter modules in Sytrus make their output automatically audible. Instead, you have to use the matrix to route them to the output stages according to the following options:

1. Assign an output level for the module from this matrix section.

2. Assign an effects send level for the module (the effects module is automatically send to the output).

3. (operators only) Assign the operator a filter send level via the Filter Send Levels matrix section (see above). The filter module you send to needs to 'reach' an output on its own.

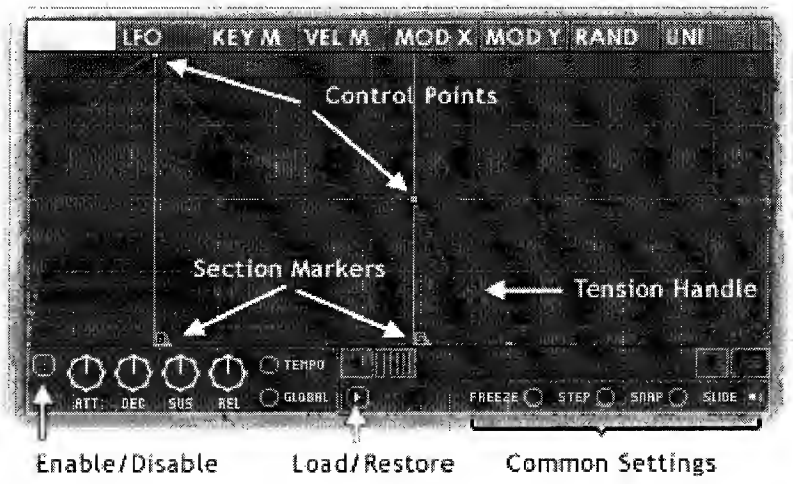
4. (filters only) Use the Send to Next knob level (please check the filter module page for more info).

Sytrus - Working with the Envelope Editor

The envelope editor in Sytrus is where you adjust the articulation settings of a module: all envelopes, LFO and mapping charts. The envelopes in Sytrus are highly customizable and each map or envelope segment can be comprised of unlimited number of with customizable tension (acceleration). The articulator also combines the best of multipoint envelopes and the best of simpler ADSR envelopes, via special section markers which make ADSR automation possible.

Common Functionality & Spline Editing

Although there are several types of envelopes and maps in Sytrus, they all share this common functionality:



Enable/Disable Switch

In order to use envelope mapping, you need to enable it first via turning on the LED at the bottom left side of the editor (see screenshot).

Load/Restore & Copy/Paste

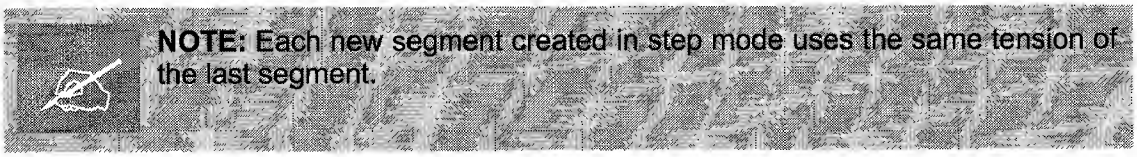
Notice the placement of the load/restore button in the screenshot above. The complexity of the Sytrus envelopes makes the save/restore feature a very handy tool for organizing a library of frequently used envelopes or complex shapes. Please notice that envelopes are previewed live in the editor as soon as you select a preset in the file open dialog box.

The menu also contains copy/paste commands to assist you in replicating an envelope to another property in the patch (however you can not paste one type of envelope to another - for example ADSR to LFO).

Common Settings

- ***Freeze*** - Enable this switch to lock the envelope curve to its current setup. This feature is helpful when you have finished changing the spline structure of an envelope and want to protect it from accidental edits (it also hides the handles providing a clear view of the shape).

- ***Step*** - Enable this option to set the editor in step editing mode - drag in the editor to create a 'free hand' curve where a new control point is defined for every step in the timeline. Hold SHIFT key while dragging to draw 'pulse' lines (straight vertical/horizontal lines only).



- ***Snap*** - Enable this option if you want the control points to snap to the nearest step in the timeline while dragging.

- ***Slide*** - Enable this option to preserve the relative distance between a dragged control point and all control points following it (this option is enabled by default).

Curve Editing

Here are several basic operations you can perform to edit the envelope/mapping shape:

- ***Add a new Control Point*** - Position your cursor over the line until the add point cursor appears ( ). Right-click and a new point will be added.

- ***Reposition a Control Point*** - Drag the control points with your left mouse button. Hold SHIFT while dragging to lock vertical position or CTRL to lock horizontal position.

- ***Delete a Control Point*** - Right-click a control point and select Delete. Alternatively, hold ALT and left-click.

- **Change Segment Type** - Sytrus offers three types of spline segments to select from. Right-click a control point and you will see three spline type options (the affected segment is the one preceding the control point): Single Curve - the default mode which allows you to create linear, ease in and ease out curves (depending on the tension); Double Curve - allows linear, ease in-out and ease out-in curves (depending on the tension); Hold - creates 'hold' or 'pulse' curves which are handy for creating abruptly value changes in your envelope.

- ***Change Segment Tension*** *(Acceleration)* - Drag the tension handle (see the screenshot above) of each spline up/down to change the spline appearance. Right-click the handle to reset to a straight line. Hold CTRL during adjustment to fine tune.

Envelope Sections (ADSR)

Some of the envelopes/mappings are divided into sections to provide classic ADSR (attack, decay, sustain, release) envelope functionality.

Sytrus uses special section markers (see the screenshot above) to mark the end of a section and the start of the next one. There are few markers available:

- ***S*** *(sustain)* - Marks the end of the decay section and the start of the release section.

- ***L*** *(loop)*- Marks the start of a sustain loop section, thus enabling you to define an envelope section to be repeated while a voice is sustaining.

- ***D*** *(decay)* - Marks the the start of the decay section.

- ***DL*** *(decay/loop)* - Combines the function of the D and L markers.

It is not required to use all, or any, of the provided markers. Without markers the envelope will be played once as a 'static' definition played once from start to finish for each voice. You can also use certain combinations as needed.

How to Add a Marker:

Right-click the control point where you want to set the section marker. From the menu select the marker you want to add. If the item you want to add is disabled make sure you're trying to insert the marker at the correct place (a sustain loop start can not be after sustain loop end, for example).

To make a Delay Loop (DL) marker, simply check both Decay and Sustain Loop Start entries in the right-click menu.

How to Remove a Marker:

Right-click the control point where the marker is placed and uncheck the item representing the marker name.

Keep in mind that removing some markers might make another marker(s) redundant, so they are removed automatically as well (if you remove the sustain loop end marker, a sustain loop start marker would not have a purpose).

Envelope/Mapping Types

There are few types of envelopes/mappings which define the articulation of a specific property: ENV, LFO, KEY M, VEL M etc. (the only exception, WS /waveshaper/ in the filter module is also covered below):

ADSR Envelope (ENV)

This is a 'classic' ADSR envelope, which combines the ability to define a sustain loop section and the power of unlimited spline segments, to refine the various envelope sections as you need.

Besides the editable envelope curve, the envelope also provides the regular envelope level controls, so you can lock the curves and still adjust some basic aspects of your envelope. All values are applied relative to the curve defined in the editor:

- ***Attack*** *(ATT)* - Defines the attack length/speed.
- ***Decay*** *(DEC)*- Defines the sustain section length/speed.
- ***Sustain*** *(SUS)* - Defines the sustain section slope ('decay' amount).
- ***Release*** *(REL)* - Defines the release length/speed.
- ***Tempo*** - This switch lets you determine whether the envelope length is relative to the project tempo (changes with tempo), or absolute in time.
- ***Global*** - Enable this option to use global envelopes. The envelope of all notes (including those already playing) restarts as each new note starts playing (so all notes share the same envelope). This is useful for making perfectly synchronized gated presets and some special effects.

NOTE: While adjusting ADSR properties you can see the effect on the envelope shape. However, once the mouse key is released the envelope is restored to its previous view. The knob still has its effect, though it is not reflected in the curve to avoid distortion and to make editing easier.

For more information on the available envelope sections (attack, decay, sustain, sustain loop, release) and how to define/remove a section marker, please check Envelope Sections (ADSR) above.

Low Frequency Oscillator (OSC)

This unit allows you to vary the controlled property with an LFO. The LFO also includes a full envelope to define its strength in time.

The secondary blue curve you can see behind the envelope is a preview of the LFO 'in action' as with the applied envelope, shape speed and settings.

The following knobs are additionally available for this unit:

- ***Speed** (SPD)* - Defines LFO speed.
- **Tension** (TENS) - Defines LFO curve 'tension' - lets you morph the LFO shape from triangular through sine-like to pulse-like (square) shape.
- ***Skew** (SK)* - Defines a balance between the odd/even splines in the LFO visible as shape 'skew'.
- ***Pulse Width** (PW)* - Sets the pulse width, i.e. balance between the first and second half of the LFO phase.
- ***Tempo*** - Lets you determine whether the envelope/LFO speed is relative to the project tempo (changes with tempo), or absolute in time.
- ***Global*** – Normally, the LFO envelope is started from the beginning for each voice ('local' LFO) . If this option is enabled, the envelope is 'global' and thus stays in the sustain state without restarting for the whole duration of the song.

Mappings: Key M, Vel M, Mod X, Mod Y, Rand, Uni

The mapping units let you map the value of the controlled property to the values of another property (keyboard key, velocity etc.).

The mapping is basically a single continuous curve where the horizontal direction represents the values of the source property used for mapping - min>max = left>right, and the vertical direction represents the values of the controlled property (articulation target) - min>max = bottom>top. By defining the mapping curve, you define how the horizontal positions are related to vertical positions, thus mapping the source property to the controlled property.

Notice the brighter vertical line in the graph. It represents the current value of the source property used for mapping (or the default value, if current is unavailable /such as with velocity/).

The Sytrus graphs cover several mapping sources:

Keyboard Mapping (KEY M)

With keyboard mapping, you can define how the controlled property is offset depending on the keyboard key (note) pressed to generate a voice. At the bottom of the graph you can see the keyboard range (the highlighted range matches the range displayed by the integrated Sytrus keyboard).

Velocity Mapping (VEL M)

With this graph you can define how the voice velocity value relates to the controlled property.

Modulation X/Y (MOD X and MOD Y)

These two graphs allow you to map the values of the integrated X/Y controller (you can find the X/Y Controller in the main module of Sytrus) to changes of the controlled property.

Random Mapping (RAND)

The random mapping lets you define the amount of randomization to the controlled property (one random value per voice is generated). This can be useful to simulate a live performance, or the slight inaccuracy of old analogue synths.

A random floating point number is selected for each voice, in the range of 0 to 100%. The curve lets you define how the random number relates to changes in the controlled property. The more curve 'dots' there are there for a certain vertical position, the greater the chance is this value will be selected by the random generator, thus allowing you to fine tune the behavior or the random generator, and effectively defining the 'chances' of certain values being selected for each voice.

Unison Mapping (UNI)

This mapping is used by the unison feature of Sytrus (see the main module for more information on the unison mode). It is effective only if the unison mode is enabled for the current patch.

The unison mode works by triggering a user-defined number of sub-voices, with altered properties for each actual voice in your sequence. Unison mapping lets you define how the controlled property varies across each of the sub-voices inside the unison.

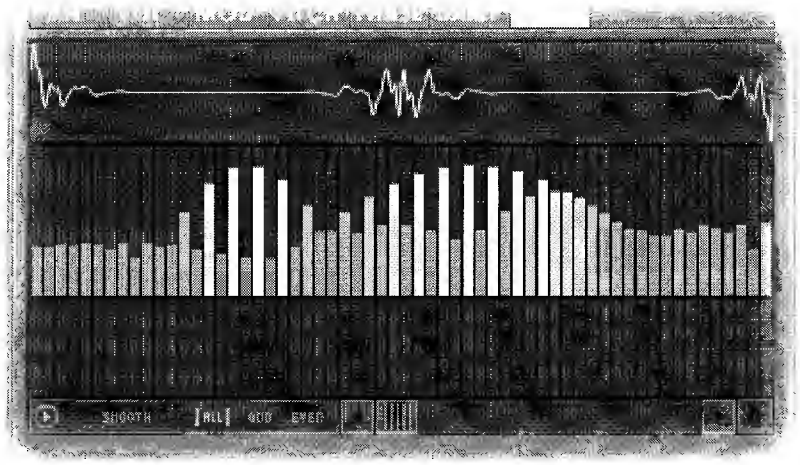
By default, the unison uses only its global variation levels (if enabled) as specified in its global settings. But defining a mapping curve in this unit, you are given a much greater control over the type and amount of variation of both property and module.

WaveShaper Mapping (WS)

This is the only articulated property defined with a single mapping, and is available in each of the filter modules. The curve defines how the signal is distorted by the waveshaper features in the filter modules - the original input levels and how they relate to the processed output levels.

Sytrus - Working with the Harmonics Editor

The operators in Sytrus contain a feature rich harmonics editor where you can define the oscillator shape with 128 harmonics, either drawing the harmonics manually, or by analyzing external samples.

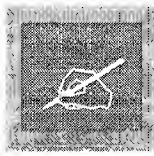


Basic Harmonic Editing

This graph allows you to enrich the operator shape with frequencies that are harmonic to the operator base frequency. After the mix is calculated, the shape amplitude is normalized to 100%.

The first top row sets the amount of harmonics mixed with the shape (order increases from left to right). Left-click and drag inside the row to add harmonics to the shape. Right-click and drag to draw 'lines' inside the graph. Alt+click to reset the harmonics levels to neutral position. The scale of the amplitude levels is logarithmic, which helps with you need to add small amounts of a harmonic to the oscillator.

Notice that some of the harmonic levels are darker. These mark the octaves offsets for convenient editing (+1, +2, +3 octaves etc.).



NOTE: The there are 128 harmonics available in the editor. To access the higher harmonics, use the horizontal scrollbar at the bottom of the graph. The default shows the first 60 harmonics only.

The second row sets the harmonic phase (time offset in the range of one oscillator cycle). These parameters apply only if the corresponding harmonic has a level higher than 0.

- ***ALL / ODD / EVEN*** - At the bottom of the graph you will notice three switches. They allow you to quickly lock the odd/even harmonics so you can edit the rest. To edit all harmonics, click ALL.

- ***SMOOTH*** - The smooth command applies smoothing to the levels in the harmonics editor (averaging the levels with the neighbors). When the odd/even harmonics are locked, only they will be smoothed (however, all harmonics are considered when computing the average values to apply).

- ***Additional Commands menu*** - Click the arrow at the bottom right corner for a set of useful commands related to working with the harmonics.

Additional Commands menu

- ***Convert shape to sine harmonics*** - The default shape as set in each operator's shape settings is a sine shape. This makes working with harmonics easier and more predictable. You can use this command to convert an oscillator with non-sine shape to the closest version represented with a sine wave. If the shape is already a sine, this command has no effect.

- ***Analyze Shape File*** - You can analyze ('import') an external sample as an oscillator shape using this command. Please note the following restrictions: the sample needs to be an oscillator shape ('single cycle' sample), as opposed to sample playback in samplers. Also, keep in mind that no actual wave sample is importer. Rather the harmonics of the sample are analyzed and imported as harmonic settings in the harmonic editor. If the sample is too long and/or complex the import might not be accurate.

- ***Transpose One Octave Up*** - This command 'multiplies' the position of the harmonics to shift them up with an octave. Keep in mind information is lost in this manner (for all harmonics and the high end which go out of range /above 128'th harmonic/).

- ***Shift Left/Right*** - Shifts the harmonics one position to left/right.

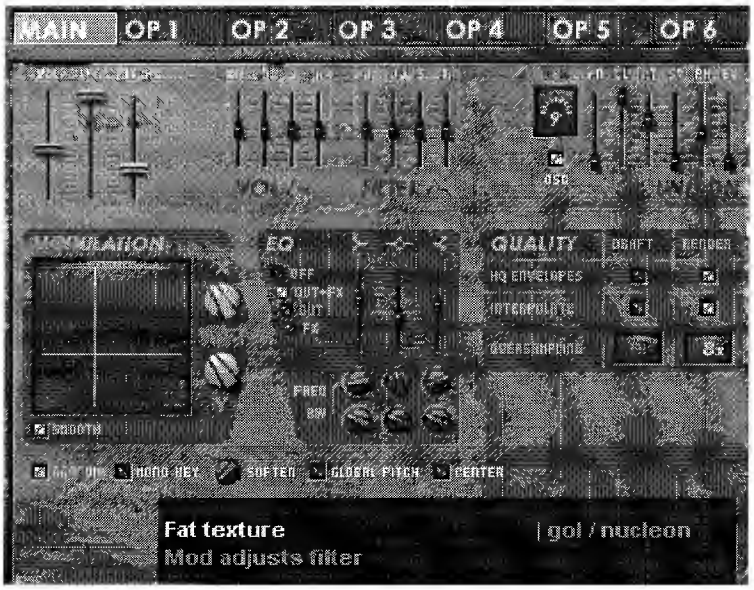
- ***Attenuate Gibbs Phenomenon*** - Applies techniques to attenuate the Gibbs phenomenon as a pre-processing step applied to the harmonic levels. There is also a runtime 'Gibbs attenuation' option, found in the Main Panel. The 'Gibbs phenomenon' causes ringing around the point of transition in oscillators with sharp transitions (discontinuous line). You can learn more about Gibbs phenomenon on the Internet.

- ***Copy/Paste*** - Allows you to copy the harmonic settings for an oscillator and paste it on another oscillator. The paste has several modes: Replace - the 'classic' way to paste - the old data is replaced by the clipboard; Add - sums the existing harmonics with the clipboard; Subtract - subtracts the clipboard levels from the existing levels; Multiply - Multiplies the

existing harmonic levels with those in the clipboard; Blend - sums the existing harmonics with the clipboard at 50%.

Sytrus - The Main Module

The main module contains some global settings of the current patch and provides less experienced users with easy to use global filter and volume envelope levels, allowing them to adjust the existing patches to their preferences, even if they lack experience in programming FM synthesizers.



Master Levels

- ***Master Level*** *(VOL)* - Sets the master volume level of the patch.
- ***Master LFO*** *(LFO)* - Sets the master LFO influence level. The property range is -128 to 128, so to effectively disable all the LFO-s across the patch, position the slider at the middle (or Alt+click to reset to the neutral value).
- ***Master Pitch*** *(PITCH)* - Sets the master pitch of the patch. Rnge is -2 octaves to +2 octaves (to use the original pitch, position the slider in the middle or Alt+click).

Global Volume & filter Envelope Levels

These properties allow you to define global offsets to the volume & cutoff/resonance envelopes of all modules in the patch.

- ***Attack*** *(ATT)* - Defines the attack length/speed.
- ***Decay*** *(DEC)*- Defines the sustain section length/speed.
- ***Sustain*** *(SUS)* - Defines the sustain section slope ('decay' amount).
- ***Release*** *(REL)* - Defines the release length/speed.

Unison Mode

The highly customizable unison mode is a great feature of Sytrus which allows you to quickly add depth and texture to even simple sounds.

Unison works by triggering a user-defined number of 'sub-voices' for each actual voice in your sequence. Each sub-voice can have slightly varied panning, volume, pitch, phasing etc. to generate a softer sound with rich stereo spread.

The global unison settings are:

- ***Unison Order*** *(ORD)* - Sets the number of voices in the unison (drag up-down). Drag down until the indicator disappears, to turn the effect off (default).
- ***Unison Mapping*** *(PN)* - Sets the panning variation across the unison voices.
- ***Unison Volume*** *(VL)* - Sets the volume level variation across the unison voices (the closer to the center a voice is, the louder it is).
- ***Unison Pitch*** *(PT)* - Sets the pitch variation (detune) across the unison voices.
- ***Unison Sub-Level*** *(SB)* - If this parameter is set higher than zero, a duplicate for each unison voice is created, with a pitch offset of -1 octave. The parameter sets the volume of the sub-level voices.
- ***Unison Phase*** *(PH)* - Sets the initial oscillator phase variation across the unison voices.
- ***Envelope variation*** *(EV)* - Sets the amount of variation added to the attack and decay of the filter cutoff, resonance and volume envelopes of each unison voice.

Additional to the global settings in this section, unison is completely programmable via the unison mapping available in the articulation section for each module. It is possible to load several presets for the unison settings by clicking the Options button on the Sytrus interface (●) and pointing to the unison submenu.

NOTE: Keep in mind that **unison** triggers real voices instead of simulating the effect via audio processing (such as chorus). The polyphony of Sytrus in unison mode is multiplied by the number of unison voices. So a three-note chord with 9th order unison can easily use 27 voices. Unison will consume a lot of **CPU capacity** if not used in moderation. Where possible, try to achieve similar effects with the integrated chorus FX.

Modulation (X/Y Controller)

The modulation interface provides two adjustable controllers (horizontal and vertical direction). These controllers have no inherent effect on patch sound and parameters, and are provided to be linked with real-time controllable parameters within Sytrus.

To set the values of both controllers, drag inside the controller screen or adjust the knob values provided for the X and Y values.

Set the initial Mod X/Y values for each individual note with the Piano Roll properties (in the note properties menu you will find two additional entries: Mod X and Mod Y).

The Smooth option can be enabled if gradual smooth changes are preferred over quick changes for the linked properties and articulators.

For more information on the Mod X/Y mappings, check the envelope editor page.

Equalizer (EQ)

Sytrus includes a parametric three-band equalizer, which can filter the effects module signal and/or the output signal.

- ***Scheme Selection*** *(LED check boxes)* - Allows you to select how the equalizer is processed in the synth mixing chain. OFF: disables the equalizer; OUT+FX: Filters both the effects module signal and the main output signal; OUT - Filters only the main output signal; FX - Filters only the FX module signal;
- ***Equalizer Bands*** - Three bands with adjustable range and frequency. The first band is low shelf, the second is peaking band and last is high shelf. Using these you can achieve all basic types of frequency filtering - low pass, high pass, band pass, peaking, notch filter, bass boost, etc.
- ***Frequency Knobs*** - Let you adjust the frequency of each corresponding EQ band (turn to right to increase frequency).
- ***Range Knobs*** - Let you adjust the range (width) of each corresponding EQ band (turn to right to increase band range). Bands with wider range have more impact over the filtered signal.

Misc Settings

- ***Random*** - Enables random mapping in the articulation sections of each module (see the envelope editor page for more information on random mapping). When using property variation via random mapping to simulate a live performance or old analogue synths, this option allows you to quickly turn the randomness off, and get 'perfect' output without changing your settings.

- ***Mono Key*** - Enable to limit the number of voices per key to one (unison voices are still generated if unison is enabled). Use this option to suit the kind of patch created. For example, you might want to turn it on for a guitar patch, and leave it off for a pad synth patch.

- ***Soften*** - Allows Sytrus to apply a softening filter to the voice attack using velocity less than the default (100 for MIDI input/import). Turning the knob to right increases the effect, while turning it max to left disables this feature.

- ***Global Pitch*** - Enable this option to make the pitch articulation of Operator1 global, so that all other operators use it as a base from which to offset their own pitch settings.

- ***Center*** - Enable this switch to remove the DC offset from the final Sytrus output. This switch needs to be enabled of DC offset is present which affects the sound quality.

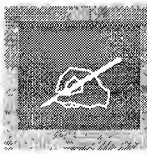
Quality Settings

The quality settings are split into two sections - draft (real-time) and rendering, thus allowing you to optimize Sytrus for real-time performance and for high-quality output during rendering.

- ***HQ Envelopes*** - Increases the envelope accuracy, but with greater CPU use. In many cases, this option is not required, as the default setting is sufficient.

- ***Interpolate*** - Enable this option to interpolate the operator shapes. Since the shapes are defined with high detail, this option can have little effect on the overall output quality. However, it may be useful for improving the quality of an operator used at very low frequency, such as a modulator to produce vibrato effect on the carrier. It is recommended to leave this option off for draft performance, and on for rendering.

- ***Oversampling Factor*** - Enable to increase the accuracy of the Sytrus rendering engine and to overcome potential aliasing and interference problems. It is recommended to use over-sampling only during rendering, unless the patch complexity and your CPU allow for higher quality real-time performance.



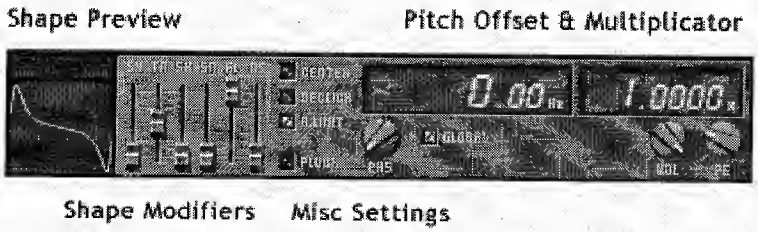
NOTE: In some cases, over-sampling may alter FM feedback sound slightly. It is advisable to test how your patch sounds with over-sampling in real-time, if you plan to use it in your final output.

Info / Comments

Make your mark on the world! In this area you can the patch name, author name and any comments on the patch usage (such as X/Y controller usage, recommended patch usage, etc.)

Sytrus - The Operator Module

The operator modules are the core of the Sytrus engine. Here the operator shape and pitch are defined, and the module supports full articulation section (envelopes & mappings of volume/pitch/phase etc.)



Oscillator Settings

NOTE: Since Sytrus Version 1.5, the harmonics have been enhanced and moved into its their own tab. To learn more, see Working with the Harmonics Editor (page 153). The harmonics editor allows you to create your own wave-forms.

Shape Preview

The shape preview shows the computed oscillator shape after being processed with harmonics and modifiers. There are three switches at the top (from left to right):

- ***Half*** - Uses only the first half of the shape phase in the sound generation.
- ***Even*** - Each odd phase of the shape is rendered silent.
- ***Absolute*** - Shape values are made absolute (only above the middle line).

Shape Modifiers

The modifiers are a set of parameters which can help you in adjusting the operator shape to suit your needs. Alt+click a modifier to reset it to its default level:

- ***Shape*** *(SH)* - Allows to morph the shape to sine, triangle and pulse (via the other modifiers you can also achieve saw and other shapes).
- ***Tension*** *(TN)* - Sets the tension (extra bending) of the base operator shape.

- ***Skew*** *(SK)* - Allows you to 'skew' the base operator shape.
- ***Sine Shaper*** *(SN)* - Applies a transform which is useful for certain patch types (such as bells).
- ***Pre-Filter*** *(FL)* - Applies a smoothing (low-pass) filter to the shape. This can reduce potential aliasing artefacts but makes the sound less bright.
- ***Noise*** *(NS)* - Adds a real-time noise to the filter shape. This can be useful with plucked mode (which requires rich spectrum) and drum/percussion samples.

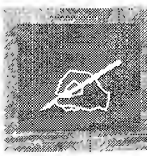
Pitch Offset & Multiplicator

Here you can set the base pitch of the operator. Position the cursor over a digit from either display and drag up/down.

- ***Frequency Offset*** - Allows you to adjust the pitch as an absolute offset in Hz.
- ***Frequency Ratio*** - A multiplication of the base pitch. The default value is 2. To increase the pitch with an octave, multiply by 2 (x2, x4, x8, x16 etc). To decrease by an octave, divide by 2 (x1, x0.5, x250 etc.).

Misc Settings

- ***Phase*** *(PHS)* - Sets the initial phase offset for the operator when a voice is started (or global offset, depends on the next option).
- ***Global*** - Enable this option to use a 'global' phase for the operator in all voices (i.e. sync the phase between all voices for the operator).
- ***Declick*** - Applies a special filter to avoid clicks when starting a voice (useful for operators with sharp attack).
- ***Center*** - For DC offset removal.
- ***Plucked*** - Turns the operator into a plucked string simulation unit. The unit basically starts with the original spectrum as set by all harmonics and modifiers then a gradual 'damping' occurs, which filters that spectrum to a sine wave with the pitch value of the operator. For this mode to work it is recommended to start with a spectrum rich operator (if you start with a simple sine there is no audible effect). The damping amount is controlled via the DAMP articulation target (see articulation below).



NOTE: An operator in plucked mode cannot be frequency-modulated (FM) by other operators, so its FM row in the matrix will be disabled while plucked mode is on (however ring modulation /RM/ is still available).

- ***Volume*** *(VOL)* - Sets the operator volume. The modulation levels in the matrix cannot be automated, however this volume property has the same effect for modulators and can be automated.

- ***Pitch Envelope/LFO Amount*** *(PE)* - Sets the range the pitch that articulators operate within (the default value is 12 semitones).

You can copy all the settings defining the oscillator and paste them to a different operator by using the Copy/Paste Oscillator Settings command in the Options menu ( ). The menu also contains the Reset Oscillator Settings in case you need to quickly revert all oscillator settings to their default position.

Articulation Section

The articulation section allows you to apply an envelope, LFO, map keys, velocity or unison mode voices to a set of predefined properties. To see the full list of envelopes/mapping in the articulation section and their meaning, please check the envelope editor page.

The filter mode supports the following articulation targets (controlled parameters):

- ***Panning*** *(PAN)* - Sets the operator output panning (graph bottom = left panning, graph top = right panning).

- ***Volume*** *(VOL)* - Sets the operator output volume (graph bottom = no output, graph top = maximum output).

- ***Modulation Influence*** *(MOD)* - Defined the amount of 'influence' other operators (as modulators) can have on the current operator (graph bottom = no modulation, graph top = maximum modulation).

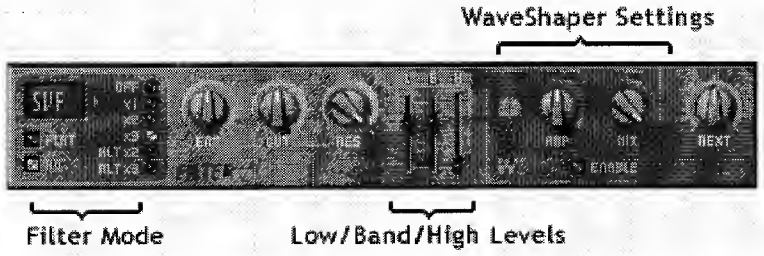
- ***Pitch Offset*** *(PITCH)* - Sets an offset to the operator base pitch (graph bottom = -100% offset, graph top = +100% offset).

- ***Phase Offset*** *(PHASE)* - Sets an offset to the operator phase (graph bottom = -100% offset, graph top = +100% offset). If you vary the phase via the LFO articulation unit, the result is a vibrato effect.

- ***Plucked Damping*** *(DAMP)* - This target has effect only if the plucked strings mode is enabled for the operator. This envelope/mappings set controls the plucked string dampening amount (graph bottom = 100% dampening, graph top = no dampening).

Sytrus - The Filter Module

The filter module provides several filter types modes and options, allowing you to get the perfect sound for your project. It includes a complete articulation section for full control over filtering parameters, as well as wave-shaping distortion with customizable mapping. The SVF filter is capable of handling three filter modes simultaneously - low-pass, band-pass and high-pass.



Settings

Filter Mode

- ***Filter Type LCD*** - Select the filter type to be used - included are a full-featured SVF ('chocolate') filter and two flavors ('vanilla'/'lime') of lowpass/highpass filters and bandpass/notch/allpass filters. Only the SVF filter will display/use the low/band/high levels on the panel (see screenshot above).

- ***Flat*** - Select to apply alternative resonance algorithm for the filter (you will need to try both modes to see which fits your project needs).

- ***HQ*** - Improves filter quality. This option is primarily needed when operating at sample rates of 44kHz or less and using the high-pass result of the SVF filter.

- ***Bandwidth*** - Sets the filter bandwidth. **OFF** turns the filter off**. x1, x2, x3** are 12, 24 and 36 dB filters respectively. **ALT x2** and **ALT x3** provide alternative algorithms for the 24/36 dB filter modes.

Common Filter Settings

These settings control some common aspects of the filter, such as cutoff and resonance.

- ***Cutoff LFO/Env. Amount*** (ENV) – Adjusts amount of cutoff LFO/Envelope articulation over the cutoff value. Turn fully to the left to disable cutoff articulation.
- ***Cutoff*** (CUT) - Filter frequency. Affects all modes of the filter - low, band high etc.
- ***Resonance*** (RES) / ***Bandwidth*** - Resonance or 'sharpness' of the filter. For bandpass/notch filters, sets filter bandwidth.

Low/Band/High Levels

These settings apply to the included SVF filter only. Each slider controls the output amount of one of the filter bands: **L**: low-pass, **B**: band-pass, **H**: high-pass.

By default, the low-pass level is set to maximum while the rest are muted.

WaveShaper Settings

Each filter module includes an optional waveshaper distortion. This distortion maps the input signal amplitude to another amplitude based on the wave-shaper mapping (check in the articulation section below).

To enable the effect, turn on the **Enabled** LED.

- ***Unipolar/Bipolar*** (+ / +-) - Allows you to set the waveshaper graph to symmetric (unipolar) or asymmetric (bipolar). Affects waveshaper envelope presentation (switching from bipolar to unipolar mode will lose all the asymmetric information).
- ***Preamp*** (PRE) - Allows you to increase the amplitude levels of the signal before it is processed with the waveshaping distortion.
- ***Mix Level*** (MIX) - Sets the mix balance between the unprocessed and distorted signal.
- ***Send to Next*** - Allows you to send the audio processed by the current filter module to the next one. Available only in the first two filter modules.

Articulation Section

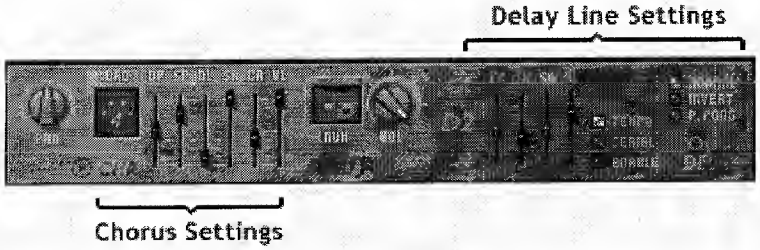
The articulation section allows you to apply an envelope, LFO, map keys, velocity or unison mode voices to a set of predefined properties. To see the full list of envelopes/mapping in the articulation section and their meaning, please check the envelope editor on page 147.

The filter mode supports the following articulation targets (controlled parameters):

- ***Panning*** (PAN) - Sets the filter output panning (graph bottom = left panning, graph top = right panning).
- ***Volume*** (VOL) - Sets the filter output volume (graph bottom = no output, graph top = maximum output).
- ***Cutoff*** (CUT) - Offsets the cutoff levels for the filter (graph bottom = -100 offset, graph top = +100 offset).
- ***Resonance*** (RES) - Offsets the resonance levels for the filter (graph bottom = -100 offset, graph top = +100 offset).
- ***Low-pass, Band-pass, High-pass Levels*** (LOW, BAND, HIGH) - Sets the output volume of the corresponding filter mode (graph bottom = no output, graph top = maximum output).
- ***WaveShaper Mapping*** (WS) - This is the only articulation target without a full set of envelopes, LFO etc. - since this is simply a map describing the relation between the input audio amplitude and the waveshaper processed signal. The horizontal direction represents the input levels (left>right = min>max) while the vertical direction represents the output levels (bottom>top = min>max).
- ***WaveShaper Mix Level*** (WMIX) - Sets the output volume of waveshaper processed signal (graph bottom = no distortion mix, graph top = maximum distortion mix level).

Sytrus - The Effects Module

The effects module offers high-quality chorus effects and three delay lines, which can process either in parallel or in serial, and the ability to send the module output to a mixer send track for further processing.



Panning (PAN)

Allows you to pan the signal *before* it is processed by the effects.

Chorus Effect

The chorus effect enables you to enrich the stereo panorama and depth, even for simple patches. It can also be used as a less CPU-intensive alternative to the integrated unison mode (see the main module on page 155), if you don't need to use any of the advanced unison features, such as sub-level voices, custom parameter mapping etc.

- ***Order*** (ORD) - Sets the number of 'stacked' flangers to be used for the effect. Using more flangers makes the effect smoother and richer. Drag the screen down until the indicator disappears to disable the effect.
- ***Depth*** (DP) - Controls the 'chorus depth' (amplitude of pitch oscillation for each of the stacked flangers).
- ***Speed*** (SP) - Controls the flange speed (speed of pitch oscillation).
- ***Delay*** (DL) - Variable amounts of delay can be applied to each of the stacked flangers. Use this parameter to define the overall amount of delay applied.
- ***Spread*** (SR) - Each flanger is assigned a different speed, depth etc. in a range defined by the basic properties provided for the Chorus effect. Increase the SPRD value to 'smooth' the spreading of the stacked flangers across the parameter ranges.
- ***Chorus Stereo Cross*** (CR) - This parameter applies a stereo cross mix between the left and right channel audio output of the Chorus effect. Increase the parameter value to mix more of the left channel sound in the right one and vice versa. The parameter has range of -128 to 128. Negative values mix inverted sound in the opposite channel.
- ***Chorus Level*** (VL) - Determines the level of the processed signal into the overall mix.

You can load several presets for the chorus effect by clicking the Options button on the Sytrus interface (⚙) and pointing to the chorus submenu.

Send Track Settings

Here you can select a mixer send track and send level if you want to send the signal to a track for further processing.

Select the send track number from the LCD (**NUM**) and adjust the send level (**VOL**).

Delay Line Settings

The effects module includes 3 separate delay lines (echo) which can process either in parallel or in serial.

To see the settings for each delay line, select one via the **D1/D2/D3** switches.

To enable the effect, turn on the **Enabled** LED.

- ***Delay Feedback*** (FB) - Sets the feedback volume. Setting to maximum will create feedback that never fades out, while setting it to minimum will result in no feedback.
- ***Delay Time*** (TM) - Sets the signal delay time, and amount of time between echoes in the feedback.
- ***Delay Stereo Offset*** (SO) - Lets you set a time offset for the left or right audio channel, thus creating richer stereo panorama of the delay effect. To delay the left channel, use a negative offset value. To delay the right channel, use a positive value.
- ***Delay Volume*** (VL) - Sets the delay line output. Keep in mind this parameter has a range of -128 to 128 - to decrease the delay volume, position the slide near the middle. Negative values produce echoes with inverted signal (phase).
- ***Delay feedback Mode*** (NORMAL, INVERTED, P.PONG) - Sets the feedback stereo mode. Normal preserves the original stereo, Inverted swaps the left and right channels once, Ping Pong swaps the left and right channels for each successive echo.
- ***Tempo Based*** (TEMPO) - Enable to make the delay speed tempo based rather than absolute in time.
- ***Serial Processing*** (SERIAL) - Enable to feed the next delay filter with the output of the current delay (thus processing in serial as opposed to independent parallel processing). Only the first two delay effects have this option.
- ***Enabled*** (ENABLED) – Switch on to enable the current delay line.

Articulation Section

The articulation section allows you to apply an envelope, LFO, map keys, velocity or unison mode voices to a set of predefined properties. To see the full list of envelopes/mapping in the articulation section and their meaning, please check the envelope editor page.

The filter mode supports the following articulation targets (controlled parameters):

- ***Panning*** (PAN) - Sets the module panning (graph bottom = left panning, graph top = right panning).
- ***Volume*** (VOL) - Sets the module volume (graph bottom = no output, graph top = maximum output).

Sytrus - Notes & Tips to Patch Creators

Recommendations for Patch Authoring

The following recommendations will ensure the patches you make are immediately usable, merge with the other presets, and don't use a lot of CPU power, while maintaining audio quality:

- ***Text formatting*** - It is recommended to copy/paste the details text from the Default preset. The provided layout and colors are easy to read and provide a common format for the details text in all patches.
- ***Patch filename*** - Try to put a category name before the patch name, otherwise you will get some presets with a category, and others without. For example: 'Piano - rhodes.fst'.
- **Unused matrix knobs** - Don't leave knobs in the matrix active if they are not to be used. For example, if a filter is not used, it should not have an output level.
- **Envelopes -** Pay attention to the sustain point. It is the most important part of the ADSR envelope. A voice stops when all of the envelopes have completed their release part. The envelope section after the sustain point is important and it is recommended that all of the operators and FX match it.
- **Envelope release** - When previewing your patch, try to press a key for a very short time, and see if it still releases properly (if there is a problem, you will hear a 'lag' in release response even if you don't use long release time). If not, an articulator inside your synth is holding the voice active. Try to find it and adjust accordingly.
- ***DC offset*** - Pay attention to possible DC offset. If your patch causes a DC offset, switch the 'center' option on for the oscillator(s) that cause that effect.
- ***Keyboard mapping*** - With FM synthesis you might need to check if higher notes produce aliasing, and reduce the modulators levels using the keyboard mapping if needed. The last key you've pressed appears in the keyboard mapping editor.

- ***User modulation*** - To increase usability of the preset, always try to give a use to the integrated X/Y Controller (Mod X/Y) and explain what each direction means, as in the included presets.

- ***Chorus/unison*** - This creates a 'thicker' richer sound. Try not to use the maximum settings (especially true for the unison effect), as the increase of order uses more voices and hence CPU. For example an order of 6 = 6 sub voices per voice.

- **Aliasing** - Try to avoid aliasing using normal means, before using the over-sampling feature: 4x over-sampling = 4 times more CPU usage.

- **Shapes** - Try to avoid using custom shapes for more than two or three operators (unless the specific patch requires it). Due to the serialized processing, it affects the cache, and therefore CPU use. Try to keep at least three oscillators as pure sines, so that they are shared.

Other Tips

- **Default patch** - If you want to start a patch from scratch, load the Sytrus preset named Default. All controls in this preset are reset to their default state.

- **Plucked mode** - Always ensure the oscillator has rich spectrum if you are going to use it in plucked string mode. The best way to ensure that is to add good amount of noise via the Noise modifier.

- **Vibrato effect** - You can use a modulator with very low pitch as a vibrato effect on the carrier.

- **Use chorus instead of Unison** - If you don't use the advanced features of the unison mode, you can try using the chorus effect in the effects section instead and save some CPU power.

Performance tip – Making a subtractive Synth patch with Sytrus

1. Start with the default preset.
2. Select operator 1, right-click the waveform view and select 'saw'
3. Do the same for operator 2
4. Change the tuning of operator 2 to something like 2.01

5. Route operator 1 & 2 to filter #1 in the matrix, 66% is about right. Check the FL Studio hint window to see this value.

6. Go to filter 1 and enable the envelope on its cutoff

There you have it, a classic, 'saw' sound synth patch!

FM Synthesis and Sytrus

by Eric Mitchell

FM Synthesis is typically regarded as black magic by most amateur synthesizer programmers. The Yamaha DX-7, the first popular FM synthesizer, was reported to have 90% of maintenance returns complete with their presets intact. You have probably browsed through the presets in Sytrus, and wondered, "'how did they do that?". The next step, then, is usually to search the Internet for FM synthesis tutorials, only to dicover that most of them tell you how to program a Yamaha DX7, or a particular DX7-like FM synthesizer to achieve a handful of particular sounds. But there's no clear idea how those "FM fundamentals" apply to Sytrus'. This tutorial will help remove some of the mystery from FM synthesis in general, and help you on your way to understanding what all those mysterious controls and knobs in Sytrus do.

Operators, Modulation Matrix, or Filters.

This tutorial is all about the Sytrus FM synthesizer, and the purpose behind the most important controls on its variety of control panels. This tutorial will not discuss each knob and slider, and how each individual control affects the output signal. However, after proceeding through this tutorial, you will understand:

- What an "operator" is.
- How the modulation matrix is configured to route sounds from the oscillators through the modulators, filters, and effects processing to the output.
- How to apply a filter to an operator.
- The single difference between FM and subtractive synthesis

Step 0: Learn about subtractive synthesis basics

It's fairly easy to get a basic grip on it. Starting with simple waveforms, filters and envelopes are applied to get different "effects" on the final sound. With most subtractive synthesizers, you can pick a knob at random, tweak it, and likely hear a difference in the sound that comes out as a result. The 3xOSC or TS404 plugins are a good place to start out. Once you're comfortable with terms like, "oscillator", "LFO", "cutoff", and "ADSR", you may proceed.

Step 1: Understand what you're looking at in Sytrus

1.1 Add a Sytrus channel. Click the "plug" in the upper left of the window, and select the "Default" patch. This patch produces a pure sine wave output. Ignore the 9x9 matrix control on the right side of the window for now.

1.2 Click the "MAIN" box in the upper left to see how the synthesizer's overall characteristics are defined. These parameters operate on the signal that comes out of the synth/filter/pan/fx module. You can apply an overall volume and filter envelope, tweak the basic EQ, add a unison effect, and determine which parameters are affected by the x/y modulation controls.

1.3 Click on the "OP 1" box towards the top of the window. This panel defines "Operator #1". An operator is simply a waveform; some audio signal. You can see one cycle of it in the box in the upper left. The sliders and knobs to the right of the waveform display allow you to modify some characteristics of the waveform. The row of buttons, "PAN", "VOL", etc. allow you to modify the characteristics of the waveform. "OP 2" through "OP 6" allow you to define five more waveforms.

1.4 Click on the "FILT 1" box towards the top of the window. This panel defines "Filter #1". The panel and rows of buttons allow you to specify the characteristics of a filter, which can be applied to the output of the operators. "FILT 2" and "FILT 3" allow you to define two more filters.

1.5 Click on the "FX" button towards the top of the window. This panel defines a basic effects chain consisting of panning, chorus, three delay units, and reverb.

Step 2: Sytrus, the Subtractive Synth, part 1 - The Sawtooth Wave

As a first step in learning how to program the Sytrus synthesizer, we will examine its capabilities as a subtractive synthesizer. This will build on our knowledge from Step 0, above, as we start to learn how to find our way around Sytrus without getting too complicated.

2.1 Go back to the "OP 1" panel, and slide the "SH" slider (just to the right of the waveform display). As you slide it up, the waveform will change from a sine wave through triangle, saw, and square patterns, ending up with a square pulse. Set the slider in the middle of its range (50%) to produce a sawtooth wave. Play some notes and listen to the buzzing of all the high frequency components in the sawtooth wave.

2.2 Now we'll take a look at the modulation matrix. In the Default preset, only one knob is activated. On the far right of the OP1 row, the knob in the "OUT" column is turned all the way up, to 100%. This knob indicates that the output from OP1 should go straight to the output at full volume. Each of the top six knobs in the "OUT" column indicate how loud each of the operators should be in the output mix. The bottom three knobs indicate how loud the output from each filter should be in the output mix.

Step 3: Sytrus, the Subtractive Synth, part 2 - a basic filter envelope

3.1 Now, we'll apply the default filter to the saw wave in operator 1. First, right click the OP1 output level knob to mute it. Play some notes. Note that there is now no output from Sytrus. At least one of the various output knobs must be turned on to generate any output. So, to activate the output of filter 1, turn the output knob on the F1 row up to 100%. Play some notes. Note that there is still no output from Sytrus. At this point, we're sending 100% of the output from the filter to the output. However, there's no input signal to the filter, so no sound will be generated.

3.2 To send some of the OP1 signal to the first filter, turn on the knob in the first column of the F1 row, and set it to the full on position, 100%. This sends the output of OP1 to the first filter. The output knob in the F1 row sends the output of the first filter to the output module. Play some notes. The default filter, applied to the saw wave produces a cheap synth horn sound.

3.3 Activate the cutoff envelope for the first filter. Click on the "FILT 1" button toward the top of the window. This displays the Filter 1 settings. Click the "CUT" button in the middle row of buttons. This displays the parameters for the filter cutoff envelope. Click the "ENV" button to display the default envelope. Just under the bottom of the graphical envelope display are four knobs to set the Attack, Decay, Sustain, and Release parameters of the envelope. To the left of these four buttons, is a small, hollow radio button. The default setting is "off", indicating no filter cutoff envelope should be applied. Click the radio button to activate the filter cutoff envelope. Play some notes. Note how the cutoff envelope alters the sound of the "horn". Experiment with the ATT, DEC, SUS, and REL knobs to see how they alter the sound of the wave.

Step 4: An Introduction to Modulation

The modulation operation: Basically, two waves combine in a magic way to create a richer spectrum output. It is important to note that OP1 modulating OP2 (OP1*OP2) does not produce the same output as OP2 modulating OP1 (OP2*OP1). Well, it's not that important, but just know that tweaking the OP1/OP2 modulation parameter will result in a different output than tweaking the OP2/OP1 modulation parameter.

Step 5: Sytrus, the FM synth, Simple Modulation

5.1 First, deactivate the filter by right-clicking on the OP1/F1 knob. Re-activate the OP1 output by right-clicking on the OUT/OP1 knob. Play some notes. The sound should be that of the original, unfiltered, buzzy, sawtooth wave.

5.2 Now, apply some modulation to the sawtooth wave. First, play some notes to get a feel for the unmodulated sawtooth wave. Now, click the knob in the OP2 column of the OP1 row, and turn it to a setting of 25%. Play some more notes. Hear how the buzzing quality has changed slightly. Turn the modulation knob from 25% to 50% and hear how the quality of the sound has changed again. Try settings of 75% and 100%.

Congratulations, you've now created an actual FM synth patch.

Step 6: Filtering a modulated signal

6.1 Now, we'll apply the filter we created above to the FM modulated signal. Deactivate the OP1 output by right clicking on the OUT/OP1 knob. Make sure the OUT/F1 knob is activated. If not, right click it to activate it. Activate the OP2/F1 knob by turning it to 100%. Play some notes. The sound will be that of a pure sine wave. What's going on here?

Well, what we actually did is route OP2 (an unmodulated sine wave) into Filter 1. Operator 2 is still at its default setting of a sine wave, so the output generated is a filtered sine wave, or, in other words, a sine wave. What we wanted to do is send OP1 into Filter 1. (This may be the most confusing feature of the modulation matrix itself.) This is part of what I mean by OP1*OP2 not being the same as OP2*OP1. Since we configured OP2 to modulate OP1, in order to send the modulated OP1 output to a filter module, we must use the OP1 column of the desired filter row to route that signal accordingly.

6.2 To route OP1 into Filter **1**, deactivate the OP2/F1 knob by right clicking on it, and re-activate the OP1/F1 knob by right-clicking on it. Now, we are routing the modulated OP1 signal into the filter. Play some notes. Now, the filter we created above is acting on the modulated signal.

Step 7: The single difference between FM and Subtractive synthesis

Subtractive synthesis uses richer waveforms (triangle waves, square waves, etc.) as the base signal before applying filtering, resulting in higher order harmonic content in the synthesized signal. FM synthesis creates richer waveforms via modulation, resulting in "sidebands" of the carrier signal (i.e. the operator being modulated). That's it. Both filter use filters, envelopes and modulators on the sound. Once you understand what the knobs in the modulation matrix do, you're off and running.

FM Synthesis can seem intimidating because it does not seem as intuitive as basic subtractive synthesis. The "sidebands" resulting from the modulation operations are not as easily visualized as relatively simple square waves, or triangle waves. Also, FM synthesizers typically have much more complex envelopes and automation capabilities (see the "Electrocution" preset for a complex automated filter example), adding to their complexity and intimidation factor.

However, I hope this tutorial has taken some of the mystery out of programming the Sytrus FM synthesizer.

Have fun!

Wasp

Wasp comes as a demo version in FL Studio and needs to be purchased separately if you want to save projects containing Wasp channels. Wasp is a three-oscillator synthesizer with two LFOs and two ADSR envelopes, a ring modulator, FM, PWM and a distortion unit.

Parameters, Filter Section

The Filter section is located on top left.

- ***Cutoff*** *(CUT)* - Adjusts the Filter cutoff frequency. The keyboard track ('KB TRACK') button makes the cutoff frequency dependent on the actual note played - higher notes mean higher cutoff, lower notes means lower cutoff.
- ***Resonance*** *(RES)* - Adjusts the Filter resonance.

- ***Envelope Amount*** *(ENV)* - The amount the filter cutoff frequency is affected by the Filter ADSR.

- ***Filter Type*** - The six green buttons select the filter type. LP[fat] = 24 dB Lowpass Filter, LP+NOTCH = 12 dB Lowpass + Notch Cascade, DBL NOTCH = double notch filter, BP = 24 dB Bandpass Filter, HP = 24dB Highpass Filter.

Oscillator section

- ***Coarse Tuning*** *(CRS)* - The two CRS knobs set the pitch for the first and second oscillators. Coarse tuning is adjustable in the range -3/+3 octaves.

- ***Fine Tuning*** *(FINE)* - The two CRS knobs set the pitch for the first and second oscillators (fine tuning in -1/+1 semitone).

- ***Oscillator Shape*** - The green buttons set the shape for the first two oscillators. The third oscillator can only use square or sawtooth shape.

- ***Mix Slider*** - The slider between OSC1 and OSC2 adjusts the mix of the oscillators in the final sound. Slide max to left to hear only OSC1, slide max to right to hear only OSC2.

- ***Amount*** *(AMT)* - Sets the volume of the third oscillator, which is zero (inaudible) by default.

- ***Ring Modulator*** *(RING MOD)* - If turned on, modulates oscillator 1 and 2. This often leads to a harsh metallic sound, depending on the shapes and frequencies of the oscillators.

- ***Pulse Width*** *(PW)* – Takes effect when at least one of the oscillators is set to the square shape. Shortens one of the square shape sides, thus altering the final sound. Turn fully to the left to use the default square shape.

- ***Frequency Modulation*** *(FM)* - Modulates the frequency of oscillator 2 with the output of oscillator 1. To hear the effect, set the mix slider to the right. Classic FM uses sinewaves (the 3rd oscillator shape).

LFO-1 (Low frequency Oscillator)

- ***LFO Shapes*** - The green buttons select the LFO shape to be used – either sawtooth, square, sine or noise.

- ***OSC 1+2 / FILTER / PW – LFO-1*** - Modulates output pitch (OSC1+2), filter cutoff frequency (FILTER), or Pulse Width (PW), depending on the option highlighted.

- ***SYNC*** - Synchronizes the frequency of the LFO to a multiple of the current tempo.

- ***RESET*** - Sets the LFO to the beginning of the LFO waveform (phase is zero) when a note is triggered.

- ***AMT*** - Sets the effect strength over the controlled value.
- ***SPD*** - Sets the modulation speed.

LFO-2 (Low frequency Oscillator)

- ***LFO Shapes*** - The green buttons select the LFO shape to be used – either sawtooth, square, sine or noise.
- ***OSC 1 / OSC MIX / AMP - LFO-2*** - Modulates Oscillator 1 (OSC1) pitch, mixing ratio of oscillator 1 & oscillator 2 (OSC MIX), and volume of the whole output (AMP). SYNC+RESET work as described above.
- ***SYNC*** - Synchronizes the frequency of the LFO to a multiple of the current tempo.
- ***RESET*** - Sets the LFO to the beginning of the LFO waveform (phase is zero) when a note is triggered.
- ***AMT*** - Sets the effect strength over the controlled value.
- ***SPD*** - Sets the modulation speed.

Amplitude ADSR

This is a standard ADSR volume envelope. The link button links the filter and amplitude envelopes for convenient editing.

Filter ADSR

This is a standard ADSR filter envelope.

Distortion Parameters

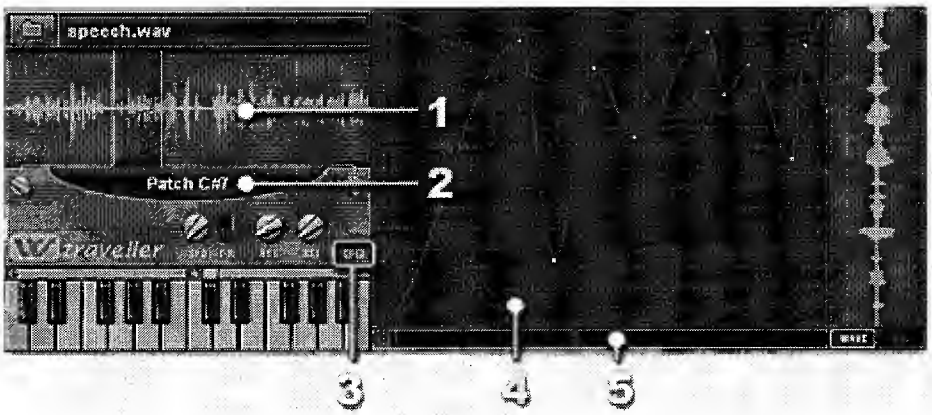
- ***Distortion*** *(DIST)* - The green button turns the distortion unit on/off.
- ***Drive*** *(DRV)* - Adjusts the drive. More drive means heavier distortion.
- ***Tone*** *(TONE)* - Changes the color of the distortion. Turned to the left, the sound gets bassy, turned to the right, brighter.

Plugin Credits: Richard Hoffmann, Didier Dambrin (interface)

Wave Traveller

Wave Traveller is an accurate vinyl scratch simulator. Instead of trying to recreate the effect by operating in real-time on a virtual turntable, like with the **Fruity Scratcher (see page 220)**, here you can assign a scratch 'phrase' to each note by drawing and fine tuning special 'path' splines the generator follows, to recreate the effect. Ability to alter spline forms, wave range and speed is provided.

1. **Preview Panel**
2. **Patch Selector**
3. **Keyboard View Scroll**
4. **Path Definition Panel**
5. **Mutes Definition Area**



How to Use the Wave Traveller

Select a Sample to Scratch: Click the Browse Sample button at the top left side of the window and select a sample to use.

Select a Patch to Edit: Each note of the channel contains a separate patch, with its own settings and scratch phrase. To select a patch to display and edit, please click on the Patch Selector (2), or click the corresponding key on the preview keyboard. If the key is not visible, use the Keyboard View Scroll buttons (3) to display different octaves on the keyboard.

Define a Phrase for the Patch: The phrase depends on the active region you select to use for the scratch, the speed and the path spline. You can also define a custom attack (fade in) and release (fade out after key release) for each patch.

The region is defined by the Start and End button you can find at the bottom left and bottom right side of the Preview Panel (1). You can see in the preview panel the section which will be used for the phrase.

The Speed knob and the T-A switch define the speed of the phrase, which also affects its pitch, like with a real vinyl. Read more about these settings in the Parameters section below.

The path spline is defined in the Path Definition Panel (5). This is basically a spline which defines the way the generator 'travels' back and forth on the sample as time progresses, i.e. horizontal dimension represents time, while vertical dimension represents the wave position (only in the region defines by the Start and End buttons). You can see the used section of the wave displayed vertically on the right side of the panel (above screenshot). The path spline itself it a set of basic spline section connected to each other. For more information on this panel, see the Parameters section below.

NOTE: You can also define a spline, a mathematical word for a smoothly curving line segment, to alter the volume over time in the same panel, or to mute certain sections of the phrase. See Parameters below for more information.

Play a Patch: To play a patch, simply use the Piano Roll or Step Sequencer to trigger the note the patch is assigned to.

Parameters

Preview Panel: The preview panel displays a preview of the full wave, the range defined by the Start and End buttons and the path spline inside that region.

Settings Panel

- ***Start*** - Knob positioned at the top left side of the Settings Panel. Defines the start point of the region used in the current patch.
- ***End*** - Knob positioned at the top right side of the Settings Panel. Defines the end point of the region used in the current patch.
- ***Patch Selector*** *(2)* – Provides a list of patches available to the generator (each note holds a single patch). Select a patch to edit and you will see its properties displayed in the window.
- ***Speed*** *(SPD)* - Knob that defines the scratch phrase speed and support two modes (which you select with the T-A switch, see below). In Tempo Based mode, the speed knob defines a number of steps as the length of the phrase (fractions are also allowed), while in Absolute mode you set the speed as a percent of the original wave speed (i.e. 100% speed with a straight path spline plays the wave at normal speed).
- ***T-A Switch*** - Defines whether the phrase speed is defined as tempo-based (steps) or absolute value (percent of the original wave speed).
- ***Attack*** *(ATT)* - Knob that allows you to define an attack time (fade in) for the current patch.
- ***Release*** *(REL)* - Knob that allows you to define a release time (fade out after key release / note end) for the current patch.
- ***Keyboard View Scroll Keys*** *(3)* - Allow you to scroll the preview keyboard left or right with an octave, so you can access the whole piano range available to the FL Studio generators.

Preview Keyboard

The Preview Keyboard allows you to preview and select patch for editing (simply click a key to select/preview).

If the key is not visible, use the Keyboard View Scroll Keys (3) to scroll the view to access it.

Path Definition Panel

The Path Definition panel allows you define the actual phrase 'path' inside the wave region selected by the Start and End buttons. You can also adjust the volume envelope and mute selected phrase sections.

Working with the Spline Editor

The spline is a set of points connected by simpler spline types (sine, line etc.), where the segment types, points number and positions are user-defined. To add a new point, left-click in the panel area.

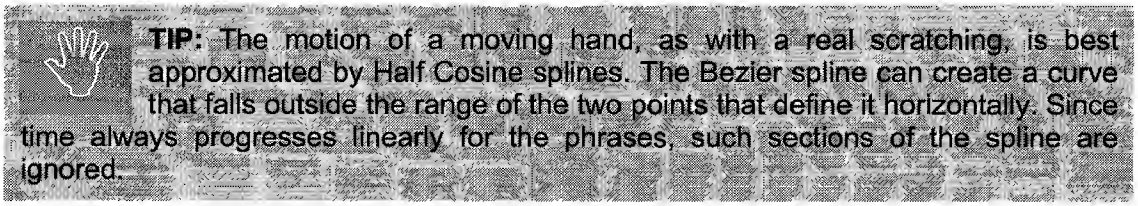
To delete a point, right-click it and from the menu select Delete. To change a segment type, right-click the point on its right side and select a spline type to be used: Half Cosine, Linear, Bezier, Tension, Quarter Since, Quarter Cosine.

Setting the Volume Envelope

Each patch contains two paths - a 'travel' path, displayed by default, and a volume envelope path , which you can see and edit by using the WAVE/VOL switch at the bottom right of the panel. The volume envelope can be defined using the same spline segments, where the bottom most position means volume 0% and the topmost is 100%.

Mute Regions in the Patch

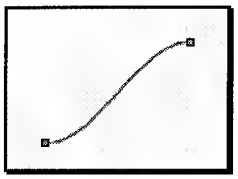
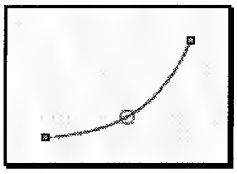
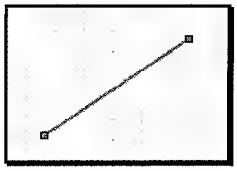
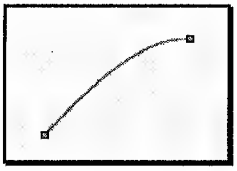
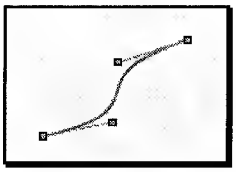
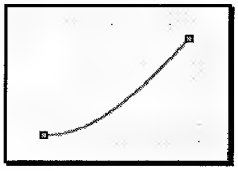
You can select specific regions to be muted inside the current patch. Left-click and drag in the Mutes Definition Area (5). The black region created as a result is muted. To unmute a region, right-click and drag instead.


TIP: The motion of a moving hand, as with a real scratching, is best approximated by Half Cosine splines. The Bezier spline can create a curve that falls outside the range of the two points that define it horizontally. Since time always progresses linearly for the phrases, such sections of the spline are ignored.

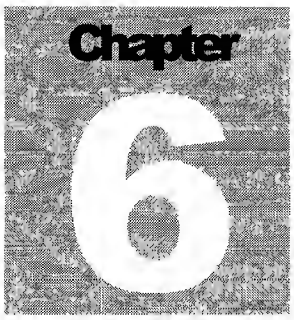
Plugin Credits: Robert Conde

See over for summary of spline types...

Summary of Spline Types

Spline Segment Types	
Half Cosine - Represents half the phase of the cosine function. 	**Tension** – A special 'tension-based' spline segment whose shape depends on the position of a special handle (the circle in the middle of the spline). 
Linear - Connects the two points with a straight line. 	**Quarter Sine** - Represents the first quarter of the phase of the sine function. 
Bezier - A classic spline with two handles for adjusting the start and end slope. 	**Quarter Cosine** - Represents the first quarter of the phase of the cosine function. 

NOTE: The **Bezier** spline type provides an additional Locked setting. Right-click a point for Bezier segment and check or uncheck Locked. When Locked is on, the two handles that appear on the left and right side of two Bezier segments are locked in a straight line, ensuring a smooth transition between the segments.



'Mix a little foolishness with your prudence: It's good to be silly at the right moment.'
Horace

The Mixer

Before you hear any of the instruments in your song, the audio output is passed though the FL Studio mixer system. Each instrument output is assignable to one of the 64 insert mixer tracks, where the sound may be processed with a set of master filters and up to 8 optional, user-selected effects per channel. As FL Studio comes with a large kit of high-quality effects such as reverb, phaser, flange, delay and filtering, you will be able to produce complete professional tracks without needing to source 3rd party plugins. However, you can also incorporate most of the popular standards of 3rd party filter plugins in the mixing chain, such as VST and DX.

In the default Mixer setup, all mixer tracks are processed in parallel, then sent to the Master mixer channel before the final sound is created. There are however, four additional send tracks, which can be used to share FX between all 64 channels. Finally, there is a routing system that can direct the audio output of a mixer track to any other track, so advanced users have the freedom to create complex hierarchical mixing chains.

Mixing as an Art form

Mixing is the process of blending and shaping sounds so they work together as a whole. It is similar to sculpting, sculpting with sound. Just as you would not expect to sit down and sculpt a 'Venus de Milo' on your first attempt, don't be surprised if your initial mixes sound a little odd. There is some good advice in the section 'setting up your studio', as speakers (monitors) play a crucial role in this phase of music production, see page 9.

TIP: Rather than boosting chosen frequencies with an EQ, try cutting those that you don't want. The same technique applies equally well to volume - lower surrounding instruments, rather than boosting the target. These techniques help your mixes sound much cleaner and clearer.

Levels and Clipping

Another major role of the mixer is to adjust the volume/levels of your track to avoid clipping. Clipping occurs when a sound wave carried inside audio equipment (analog or digital) becomes louder than the maximum volume that can be represented. Under these circumstances the peaks of the wave are squashed flat so it appears as if the wave peaks have been 'clipped' off. Clipping often produces unpleasant distortion or popping sounds.

In traditional mixing hardware, peak meters flashing red signal clipping. Fortunately, FL Studio uses '32-bit floating point' numbers to represent volume, allowing any arbitrarily large volume to be represented without clipping. The mixer peak meters then, are merely a guide to the relative volumes in each channel, and while it's good practice to keep the channel levels sensible, you don't need to obsess about red flashes in Mixer channel peak meters.

Clipping is an issue, when audio is passed *from* FL Studio *to* hardware, such as your soundcard or when rendering 16-bit WAV and MP3 files. The following steps describe how to set and monitor the final levels in your mix accurately.

How to adjust levels of the final mix

FL studio has a **Master Level**, in the menu bar (page 17) and a **Master Volume** (the fader directly below the label number 7 in the mixer window right). To ensure you are in control of the final output -

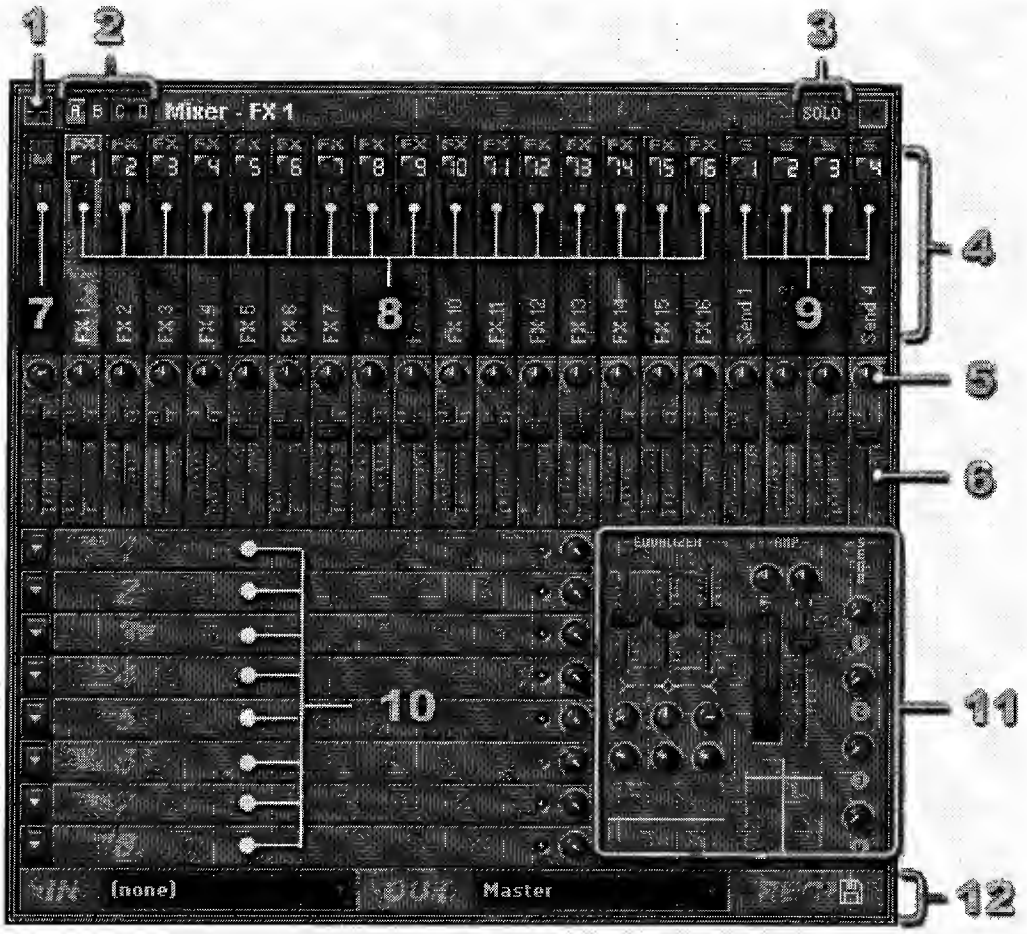
1. Leave the **Master Level** (in the top menu bar) in the default position (79%).
2. Adjust **Mixer Channel Volume** and or **Channel Volumes** (page 35) to obtain the relative instrument levels you desire in the mix.
3. Use the **Master Volume** (left most channel in the Mixer) to adjust the final level. Consider also, putting a 'Fruity Compressor', with a 'Complete Mix' setting, in the last FX bank of the master channel. Compression is a form of automatic volume control.

The above configuration will ensure both the **Master channel** peak meter, in the mixer, and the **Master Level** meter, in the menu bar (page 29), show the same levels. Red peaks, under these settings, does indicate clipping in the final output or mix.

TIP: If you would like a bigger view of the master peak metering, put a Fruity Big dB meter (page 203) at the end of the FX on the **Master Volume** channel. To protect your final mix from clipping try putting a **Fruity Soft Clipper** or **Fruity Compressor** (set to 'Complete Mix') as the last FX in the master mixer channel.

Mixer Window

This section explains the various types of tracks available in the Mixer.



1. Mixer Menu, 2. Tracks Group Selector, 3. Solo Switch, 4. Mixer Tracks, 5. Track Panning, 6. Track Volume, 7. Master Track, 8. Insert Tracks, 9. Send Tracks, 10. External Effects Banks 11. Mixer track properties, 12. Routing and recording panel.

TIP: There are 2 global volume controls and *at least* 3 local volume controls. **Global:** ***Master Level*** – in the menu bar (page 17), try not to touch this. ***Master Mixer Track*** (7 above). **Local Volume:** ***Channel Volume*** – in the Channel window (page 35), ***Mixer Tracks*** (8 above) and ***Plugins*** may or may not have volume controls inside them. That's a lot of places and a lot of flexibility.

Mixer Tracks (Channels)

The Mixer contains sixty-four insert tracks (8), four send tracks (9) and a master track (7). The insert tracks display in groups of sixteen tracks at once. To access the other groups, use the Tracks Group Selector (2). Group A displays tracks 1-16, group B displays tracks 17-32, group C - tracks 33-48 and group D - tracks 49-64.

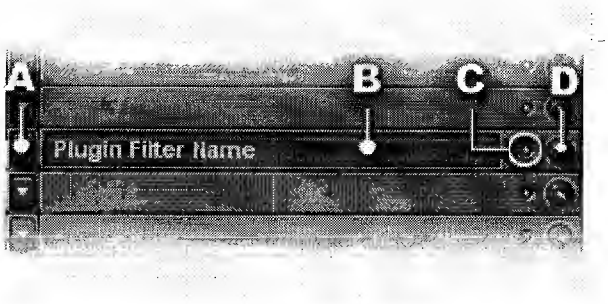
- ***Insert Tracks*** - The output of all audio instruments in FL Studio is routed to one of the sixty-four available insert tracks. In the default Mixer setup, once the audio signal is processed with the integrated filters (equalizer, volume and panning), it is sent to the master mixer track (7). However, you are free to select the output of each insert track - you can also route the audio output to any ASIO output (for users with ASIO enabled audio cards) or even another insert track. The latter is a very powerful feature allowing you to create advanced mixer setups with groups and subgroups of insert tracks (see Mixer Track Properties).

- ***Send Tracks*** - FL Studio contains four send tracks. The send tracks do not receive a direct audio input from the instruments, but they can receive audio from one or more of the sixty-four insert tracks (you can adjust the amount of signal sent by each insert track from its properties panel, see Mixer Track Properties below). Send tracks provides the ability to setup common effects (e.g. reverb and delay) in a send track, and mix more or less of the insert tracks audio with it, as opposed to adding the same effect in each insert track.

- ***Master Track*** - Unless some of the insert tracks are routed directly to an ASIO output, the whole audio output of FL Studio goes though the master mixer track for final processing before the final output.

Plugin Effects

This section covers the plugin effects section of the mixer.



A. Effect Pop-up Menu
B. Effect Name (Label)
C. Effect Mute
D. Effect Mix Level

Each mixer track can have up to eight external (plugin) effects hosted in its effects bank (10).

To open a new effect in the effects bank, select a free slot in the bank and open its pop-up menu (A). In the Select submenu, select a plugin to insert, or click More... to see a full list of effects available to FL Studio (for more information see the menu description below).

TIP: To remove an effect, select '**None**' in the Select FX submenu.

Once you insert the effect, you will see the plugin editor window (a window where you can adjust all settings of the plugin). You can click the effect label (B) to show/hide this window.

While working on your project, you may want to bypass some of the filters while adjusting your mix. You can use the mute switch (C) to disable an effect temporarily (this switch is also automatable). You can also fine tune the mix levels ('wet' and 'dry' signal) of each effect with the Effect Mix Level knob (D). Turn this knob maximum to left to effectively mute the effect. Turn it maximum to right to mix the effect at 100%.

Effect Pop-up Menu (A)

- ***Select*** - Contains a list of all effects selected as favorites. Selecting an effect from this menu will assign it to the corresponding plugin slot. Click More... to open the Select plugin window, which contains a list of all effects available to FL Studio. Double-click a plugin name to assign it to the effect slot. Click the check box preceding each plugin to mark it as a favorite (all effects preceded by a check mark will appear in the favorites list).

NOTE: To see newly installed plugins, **click Refresh** in the bottom of the Select plugin window and select Fast Scan. It is recommended that you **use Fast Scan** instead of Scan & Verify, which may cause problems if you have any buggy 3rd party plugins.

- ***Presets*** - Contains a submenu with a list of presets for the effect. In the bottom of the list you can see the Randomize and Hybridize commands. Randomize gives random values to the published (i.e. known to FL Studio) effect settings. Hybridize is a switch. When enabled, selecting a preset will load a random 50% of the settings in a preset, so you can quickly mix different presets and create new effects. The Presets menu is disabled if there is no effect assigned to the plugin slot.

- ***Browse Presets*** - Opens the plugin presets folder in the Browser panel. The Browser has better capability of displaying large number of presets.

- ***Save Preset as*** - Allows you to save custom presets for the plugin assigned to the plugin slot. Presets are saved as FST files. It is recommended that you save preset files in the default location FL Studio chooses, so they can be properly detected and added to the Presets menu.

- ***Last Tweaked Parameter*** - Displays the standard popup menu for the last parameter tweaked on the plugin's interface (applies only to automatable parameters). This option is

useful for VST effects that have their own interface (as you can not open the FL Studio property menu by right-clicking a control in them), see page 74.

- ***Browse Parameters*** - Opens the plugin's parameters folder in the Browser panel. The Browser will list all automatable properties defined by the plugin, even if they are not automated in the current project.

- ***Link to MIDI Controller*** - Allows you to link the effect to a MIDI controller, so its settings can be remotely controlled. For more information, see Live Recording Using MIDI Controller.

- ***View Editor*** - Shows/hides the effect's editor window.

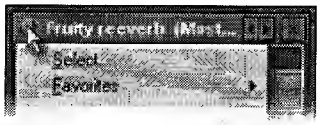
- ***Set Name*** - Opens a box where you can edit the name of the plugin.

- ***Smart Disable*** - If this option is checked, FL Studio will pause the effect if the mixer track it belongs to receives 4 seconds of audio silence. The plugin will resume again at the moment any sound is received in the track. This feature works smoothly, without clicks, pops or other artefacts, while enabling/disabling the effect, but it will not work correctly with plugins that apply 'long effects', such as reverb that has more than four seconds decay, delay lines and similar effects. It will work, however, with all kinds of equalizers, flangers, phasers, compressors etc. **Using Smart Disable may significantly lower the CPU use of your songs**.

- ***Move Up*** - Moves the effect one slot up.

- ***Move Down*** - Moves the effect one slot down.

Note that you can access the same pop-up menu from the effect editor window:



Supported Effects Standards

FL Studio supports VST, VST2, DirectX, DirectX2 and Buzz plugins, and its enhanced proprietary FL Effects format.

DirectX Plugins

DirectX plugins effects are supported in FL Studio by the special Fruity Wrapper plugin (effect version). DirectX plugins are registered on installation directly in Windows, so FL Studio will detect them no matter in what folder they were installed. However, in order the DirectX plugin system to work, you need to have installed DirectX Media 5.0 or later (it is now included in DirectX 8 (and later) run-time installation, which can be downloaded from www.microsoft.com).

VST Plugins

FL Studio supports VST plugin effects standard by Steinberg(R). Some of the effects included with FL Studio are in VST format. VST plugins are DLL files that should be installed in the VST folder of FL Studio in order to use them (<FL Studio Folder>\Plugins\VST). You can also set up an additional VST folder from the Directories window. For more information on these plugins open their help from Help menu.

VST2 Plugins

VST2 plugins effects are supported in FL Studio by using the special Fruity Wrapper plugin (effect version). VST2 plugins are .DLL files that should be installed in the VST folder of FL Studio in order to use them (<FL Studio Folder>\Plugins\VST). You can also set up an additional VST folder from the Directories window. For more information, see Fruity Wrapper's help.

Buzz Effects

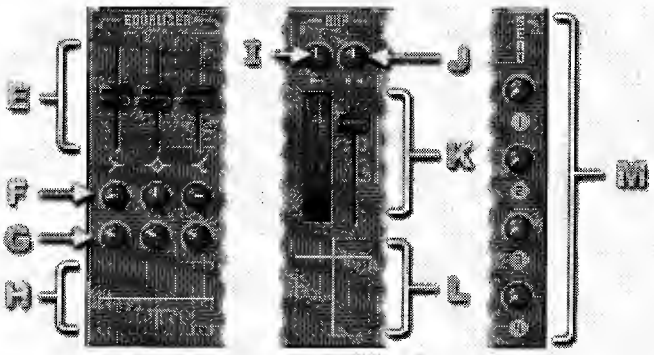
The Buzz effects plugins are an open plugin format for implementing filters in Buzz (tracker software). FruityLoops supports Buzz effects through its Buzz Effects Adapter plugin.

Fruity Plugin Standard

FL Studio incorporates an enhanced, proprietary plugin effects standard. FL plugins have their own editor interface. Most of events can be automated and edited using the Event Editor (just right-click a control in the editor).

Mixer Track Properties

This section covers the Mixer track properties panel.



E. Parametric Equalizer: Band Levels
F. Parametric Equalizer: Band Frequency
G. Parametric Equalizer: Band Width
H. Parametric Equalizer: Preview Graph
I. Stereo Separation
J. Stereo Panning
K. Volume & Stereo Peak Meter
L. Volume/Panning Preview Graph
M. Send Levels

The mixer track properties panel (11) integrates some common master filters, the recording switch and the send level buttons (insert tracks only).

Integrated Filters

The integrated filters include a 3-band parametric equalizer, volume, panning and stereo separation.

- ***Equalizer*** - Similar to the standalone Parametric EQ plugin which comes with FL Studio. However, the band types in this version are predefined and can not be changed: Band 1 - Low Shelf; Band 2 - Peaking; 3 - High Shelf;

- ***Stereo Separation*** – A filter allowing you to increase or decrease the amount of difference between the left and right audio channels of your mix. In the default position (middle), the stereo separation filter is disabled. Turn the knob fully left to maximize the stereo separation, turn fully right to produce a mono sound.

NOTE: The **Stereo Separation** filter has no effect if the input sound is mono as this filter works finding the difference between the L and R stereo channels. If there is no difference, there is nothing to filter.

- ***Volume and Panning*** - Filters that help you avoid the use of dedicated plugin filters to adjust track volume and pan levels. Volume and panning controls are also available for all visible mixer tracks (5 and 6), so you can adjust the mix levels of the mixer track quickly and easily, without selecting each individual track to see its properties panel.

All of the integrated track EQ/filters are applied after the sound has been processed with the plugin effect stack.

Send Levels

The four send level knobs (M) appear only in insert tracks. They allow you to set the amount of signal sent to each of the four send tracks in the Mixer. Turning a send level knob maximum to left turns this feature off for the specified send track (send amount 0%).

Audio Input/Output Routing

This section covers the I/O routing panel in the Mixer window

Streaming and I/O (routing) settings

N. Audio Input selector .

O. Audio Output selector.

P. Disk Recording Switch.

The audio input/output panel (12) contains the I/O routing options and the recording switch.

Routing

The basic functionality of all mixer tracks is based on the concept of taking an input audio signal from one or more sources, processing it, and then outputting the processed audio to another location.

By default, all insert tracks take the instruments assigned to them for input signal and output to the master track (and may output to one or more send tracks if set so). The send tracks can take the signal from the insert tracks and output to the master track. Finally, the master track outputs the resulting mixed signal to the audio card of your PC.

This scheme is easy to understand and is enough for most of the mixing tasks you will perform while creating simple melodies and loops. However, for bigger projects you may need to create more

complex mixing chains, with groups and subgroups of mixer tracks. The audio input (N) and output (O) routing settings allow for such scenarios, so you can, for example, assign the output of one insert track to another one.

Users who use ASIO drivers for audio output can route the tracks to the various ASIO outputs their audio card provides. These can be outputs to the individual channels of a 5.1 surround system, hardware MP3 compressors, disk streaming outputs etc. Additional outputs appear also when using the FL Studio multi output VSTi connection.

Most of the ASIO drivers provide ASIO inputs for microphone, line in etc. as well. You can route such inputs to the mixer tracks.

NOTE: The ASIO inputs are mixed together with any input audio mixer channel receives from other sources. If you only want to record the ASIO source (which is usual) make sure nothing else is sent to the same mixer channel.

Limitations of routing

1. **Only one track at a time** can output to the primary DirectSound driver (usually this is the master track). This limitation does not apply if you use ASIO for audio output.

2. **FL Studio will disable certain routing** choices if this would create a circular path (e.g. trying to route a track to itself).

3. **Send tracks can not be routed** to insert tracks.

4. **Tracks can't be routed to a send track**. Instead, use the Send Levels (M) knobs to adjust the amount of signal sent from an insert track to the send tracks or the Fruity Send plugin.

Prepare for Recording

The disk button (P) prepares a track for disk recording (to a .WAV file).

Disk Recording

This section covers the Mixer's disk recording capabilities (see page 242 for more on external audio recording). FL Studio allows you to record the output of one or more mixer tracks to .WAV files and auto-insert the resulting audio clips in audio tracks (optional).

Track recording enables you to quickly replace the real-time effects and instruments rendering for a track with a pre-rendered audio, thus saving CPU. It provides easier rendering of separate mixer

tracks for additional processing in 3rd party applications. Users with ASIO-enabled sound cards can route ASIO inputs to the track input (e.g. microphone, line in) and record it in the resulting .WAV file (see Audio Input/Output Routing above).

There are two ways to record a track: real-time (interactive), allowing recording of ASIO inputs; and non-real-time, allowing (usually) faster rendering times and higher audio quality.

Non-real-time recording

To perform non-real-time export of a track -

Prepare the tracks: Press the disk icon (P) on the routing panel. In the browse dialog that will open, select a location and name for the .WAV file to be recorded. The disk icon turns orange to show the track is ready to be recorded. Do the same for all mixer tracks you want to record.

Recording Options: Open the Mixer pop-up menu (1). In the Disk Recording submenu check 32-bit floating point recording if you want to render to 32-bit wave files. Open the Mixer pop-up menu (1) and the Disk Recording submenu check Auto-create audio tracks to insert the resulting audio clip in the Playlist audio tracks, after recording is completed.

Rendering: (Alt+R): Open the Mixer pop-up menu (1) and the Disk Recording submenu select Render to Wave File. The rendering settings dialog appears. Adjust the settings and press OK to render the track. NOTE: Some of the options available when rendering a full song are not available for track recording: render to MP3 or MIDI file, saving of NFO file with the audio clip and saving ACIDized audio.

After recording, all tracks that were activated for recording go back to their normal state.

NOTE: ASIO inputs are disabled while recording in non-real-time, such as rendering. In fact, the sound-card plays no part in the rendering process, it's all CPU and memory. In other words, the quality of your soundcard has no effect on the quality of the final track, unless you have used samples or recordings in your track made by your soundcard.

Real-time (Interactive) Recording

To perform real-time track recording -

Prepare the tracks (arm for recording): Press the disk icon (P) on the routing panel. If you use left-click, select a location in the browse dialog and name the .WAV file to be recorded. If you use right-click, an automatic file name is assigned to the track. The disk icon turns orange to show the track is ready to be recorded. Do the same for all mixer tracks you want to record.

Recording Options: Open the Mixer pop-up menu (1). In the Disk Recording submenu check 32-bit floating point recording if you want to render to 32-bit wave files. Open the Mixer pop-up menu (1) and the Disk Recording submenu check Auto-create audio tracks to insert the resulting audio clip in the Playlist audio tracks after recording is completed.

Rendering: In the Transport panel, activate Record Mode and press the Play button to start recording the state.

When you are finished, press the Stop button. At this point, all armed track will become unarmed, depending on whether you have enabled the Disk Recording > Auto-Unarm option in the Mixer's pop-up menu.

Mixer Pop-Up Menu

This section covers the Mixer pop-up menu commands.

The following command are available in the Mixer pop-up menu (1):

File

- ***Open Mixer Track State*** - Allows you to restore a previously saved mixer track state in the selected mixer track.
- ***Save Mixer Track State*** - Allows you to save the state of the selected mixer track, which includes the track settings and plugin filters.

View

- ***Controls*** - Shows/hides the volume and panning control below each mixer track (5 and 6)
- ***Names*** - Shows/hides the vertical name labels for the mixer tracks (4).

Disk Recording

- ***Render to Wave File*** - Renders all tracks prepared for recording to a wave file (see Disk Recording).
- ***Auto-Unarm*** - If enabled, all armed tracks for recording will be automatically unarmed after the recording session is complete.
- ***Auto-create Audio Clips*** - If enabled and you record in song mode, FL Studio inserts all rendered mixer tracks as audio clips in the Playlist after recording. If you are in pattern mode the audio clip will be appear only as a Channel. By default this setting is on.

- ***Latency Compensation*** - If enabled, FL Studio attempts to align the recorded audio clips with the input latency. Depending on your system and audio drivers, you may need to fine tune the clip placement.

- ***32-bit Floating Point Recording*** - If enabled, tracks are recorded as 32-bit wave files, otherwise the standard 16bit format is used.

Link Selected Channels

- ***To This Track*** *(Ctrl+L)* - All channels selected in the Step Sequencer will be linked to the currently selected mixer track.

- ***Starting from This Track*** *(Ctrl+L)* - All channels selected in the Step Sequencer will be linked to individual mixer tracks, starting from the current one. For example, if three channels were selected and the current mixer track is 4, the channels will be linked to tracks 4, 5 and 6.

Select Linked Channels (Ctrl+L)

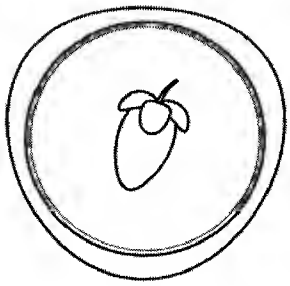
Selects all channels that are linked to the currently displayed insert FX track.

Set Name

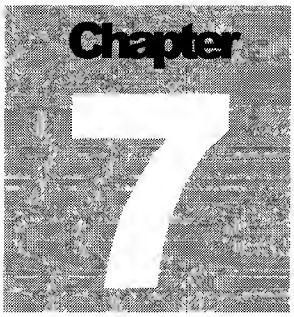
Lets you set a select a name and color for the current FX track.

Switch Smart Disable for All

Turns the Smart Disable feature for the plugin filters in all mixer tracks.



'Are you going to come quietly, or do I have to use earplugs?'
Spike Milligan



Effects Plugins

Without effects (FX), your tracks will probably sound thin and boring. Fortunately, FL Studio has a large array of FX at your disposal. If you are new to music production, getting to know what each effect does, its controls and best use, takes time. It really is a craft, so be patient.

More about 3rd Party Plugins

In case you missed this in the section on Generator plugins here it is again - The Internet is bursting with VST and DX plugins, a great place to start looking is www.kvr.com . However, please bear in mind that many of these plugins, particularly the free ones (although this is not necessarily the case) don't always conform to VST and DX standards. This means the stability of FL Studio, and any host application, may be compromised. So have fun, but remember - save often and thoroughly test your 3rd party plugins before doing any 'mission critical' work.

- **Installing VST effects plugins, see page 71.**
- **All FX, native and 3rd party are hosted by the Wrapper, see page 72 for more detail.**

NOTE: Usually, **instruments** won't run in FX channels and **FX** wont run in instrument channels (there are occasional exceptions). FL Studio can't tell if a 3rd party plugin (.DLL) is an Instrument or an Effect, without loading it first. If you try to run the wrong plugin type in the Channel or Mixer windows you get an error box about your mistake (DOH!). This is nothing to worry about, we all do this from time to time.

Buzz Effect Adapter

Buzz Effect Adapter is a wrapper for Buzz effect machines. You can find a huge collection of Buzz machines at www.BuzzMachines.com.

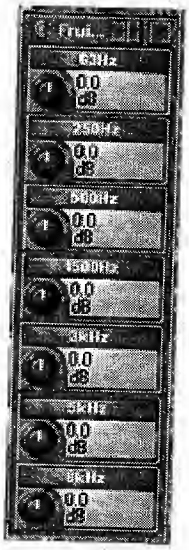
Parameters

- ***Select Machine*** - Click this button to browse for a Buzz machine plugin.
- ***Parameter Sliders*** - The sliders are used to control Buzz machine parameters. They are exposed as normal FL Studio parameters (right-click the sliders to bring the default parameter menu of FL Studio).
- ***Attributes*** - Click this button to launch a window with additional parameters for the machine.
- ***Commands*** - Click this button to launch a menu with commands for the machine. When the machine doesn't have commands, this button is disabled.

Plugin Credits: Oskari Tammelin

Fruity 7 Band EQ

Fruity 7 Band EQ is, as it names suggests, a seven-band (one low shelf, one high shelf and five peaking) equalizer plugin, optimized for low CPU use. This effect is a close cousin of the seven-band 'parametric EQ', which gives more control.



EQ is short for equalization, which is the industry term for 'tone control'. Most Hi-Fi systems have at least 'bass' and 'treble' controls, the Fruity 7 Band EQ has seven tone controls with slightly overlapping areas. If the knobs were sliders we would call this a seven-band 'graphic equalizer'. It's all the same thing.

Parameters

The parameters represent the levels of seven predefined frequency bands. Turn the knob to right to boost a band, or to left to decrease its level.

Tip

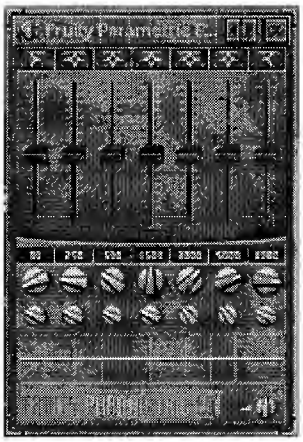
You can map the band knobs to the first row of your Phat-Boy, if you have one, for easier handling.

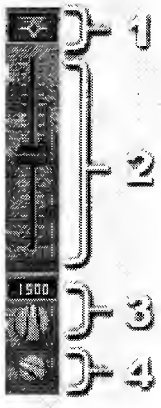
Disabled bands (level set to zero) do not use CPU processing power.

Plugin Credits: Didier Dambrin

Fruity Parametric EQ

Fruity Parametric EQ is a CPU-friendly, seven-band parametric equalizer plugin. You can adjust the frequency and width of each band in the EQ. Each band can act as high shelf, low shelf, peaking, band pass, notch, high pass or low pass filter. The plugin also contains global gain knob to adjust the overall volume.





Parameters

1) Sets filter type (peaking, low shelf, high shelf etc.).

2) Adjusts equalization amount (the level of the band). High pass, low pass, band pass and notch filters don't use that parameter (so the slider is invisible when using them).

3) Lets you adjust the center frequency of the band.

4) Sets the width of the band (turning the knob to the left makes the band wider).

TIP: Need more than seven parametric bands? You can put up to eight Parametric EQs into a single mixer channel, giving you a total of fifty-six bands. OK, seriously, two instances gives you fourteen bands - more than enough for most situations.

Disabled bands (filter type set to off) and peaking/shelf bands that are not amplified and do not use CPU resources. The plugin window is resizable, allowing you to hide the bottom part of the panel.

Plugin Credits: Didier Dambrin

Fruity Balance

Fruity Balance is a stereo balance plugin, optimized for real-time level automation to avoid pops and clicks that can accompany changes in some parameters. This is not a panning effect, it works by changing the relative volume of the left and right channels keeping the Left and Right stereo channel information independent.

Parameters

- ***Balance*** - Sets the stereo balance of the sound.
- ***Volume*** - Sets the sound volume.

Plugin Credits: Didier Dambrin

Fruity Bass Boost

Fruity Balance is a bass enhancing effect. You might need to adjust the track volume to avoid clipping since this is a 'boosting' effect. Try it on bass and kick drum sounds.

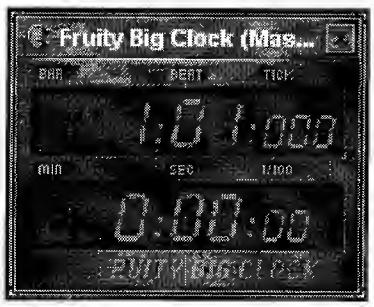
Parameters

- ***Frequency*** - Adjusts the frequency range to be boosted.
- ***Amount*** - Sets the effect strength.

Plugin Credits: Didier Dambrin

Fruity Big Clock

Can't see the menu-bar clock? Too proud to wear glasses? Then the Fruity Big Clock plugin is for you. It shows the playing time in Bar:Beat:Tick format and Minute:Second:1/100 format. Optionally, it can also display the song time in Bar:Step:Tick format.



To use, just drop an instance of the plugin on any Mixer track (the position does not matter). If only everything in life was this simple ☺

Plugin Credits: Didier Dambrin

Fruity Blood Overdrive

Fruity Blood Overdrive is a distorter, specially designed for the needs of digital-audio musicians. It provides overdrive distortion using classic techniques that give compressed and soft sounds, as opposed to the harsh sound produced by many guitar overdrive plugins.

The integrated bandpass filter gives the ability to overdrive non-guitar audio that would otherwise produce poor results.

Parameters

- ***PreBand*** - Sets the amount of band filtering applied to the audio before it is overdriven. Use to improve the effect quality that may result from overdriving audio with a broad frequency range.
- ***Color*** - Sets the frequency of the band filtering.
- ***PreAmp*** - Overdrives the audio in order to achieve distortion. As you increase the PreAmp parameter, you need to compensate with the PostGain knob.
- ***x100*** - Increases the power of PreAmp a hundred times (and you thought a volume that went to 11 was cool! ☺). Normally only useful on single instrumental tracks.

- ***PostFilter*** - The pre-amplified audio is low-pass filtered at the frequency specified by this knob. Another option for cleaning up the distortion.

- ***PostGain*** - Final gain reducer (at maximum leaves the gain at its original level after distortion). The pre-amplifier boosts the output considerably, so you need to compensate with this parameter.

Tips and Notes

The order in which the filters are applied is: Band Pass Filter (PreBand) > Preamplifier (PreAmp) > 2-Pole Low Pass Filter (PostFilter) > Reduce Gain (PostGain) > Final Digital Clipping.

If the output is too loud, do not try to reduce the input to the plugin. Reduce it with PostGain, otherwise distortion will be removed.

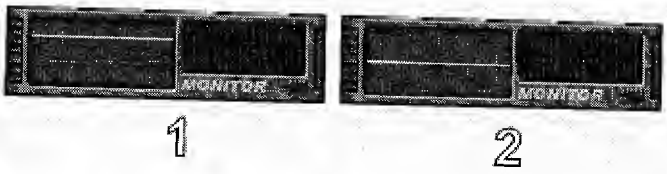
After the audio has been pre-amplified and clipped, the signal may be up to 300% out of range. When it is clipped using PostGain, normal, (harsh sounding), digital clipping is used. Therefore, a better sound is achieved if you compensate for PreAmp by reducing PostGain.

Playing a mix through the plugin, (even without pre-amplifying), causes upward compression on the independent frequency bands. This gives overall upward compression and flattens the equalizer. This can be used to improve some mixes, and can even be used to master some projects (the compression is caused by non-linear signal response similar to vacuum tube compressors).

Plugin Credits: David Billen

Fruity Center

Fruity Center removes DC offset in real-time, and is useful for synthesizers which generate DC offset with certain settings, such as TS404. The term DC offset comes from electronic engineering, and refers to the situation where a Direct current exists. In the example below, monitor 1 shows a positive DC offset. 2 shows the 'normal' case.



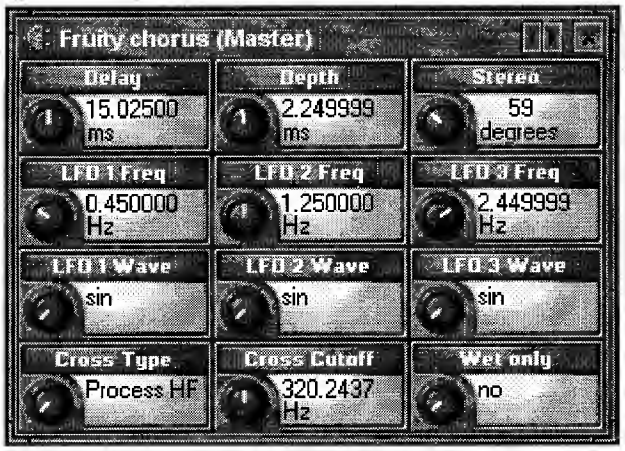
Parameters

Status - Allows you switch the plugin on and off.

Plugin Credits: Didier Dambrin, David Billen (code sample).

Fruity Chorus

Fruity Chrorus is an FL Studio exclusive plugin developed by Smart Electronix. Chorus is an effect created by the slight detuning of multiple copies of the same sound (sort of like a choir). The controls contain parameters that affect the rate, time offset, shape and depth of detune.



Parameters

- ***Delay*** - Sets the minimal delay of the delay-line inside the flanger. The flanger delay will be swept between delay and delay+depth. Range: 0 to 20 milliseconds. For 'deep' flanger effect, set this parameter to low.

- ***Depth*** - Controls the range of the flanger action. The flanger delay will be swept between delay and delay+depth. If you set this value to zero, the flanger will remain 'static' as the delay will stay constant. Range: 0 to 20 milliseconds. Setting this parameter to a higher value will create special effects and heavy modulation.

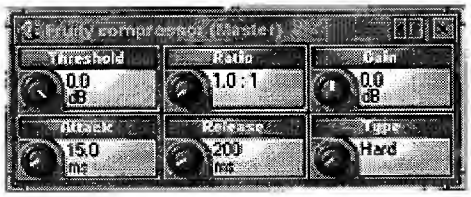
- ***Stereo*** - Controls widening of the stereo image. If set to 0, the LFO on the left and right channel will be in perfect synchronization. At 180 degrees the left and right channel will be 100% out of phase., i.e. left channel will reach maximum when right channel is at minimum. Range: 0 to 360 degrees. Try setting 10 degrees for subtle stereo enhancement.

- ***LFO 1 Freq / LFO 2 Freq / LFO 2 Freq*** - Sets LFO modulation speed.
- ***LFO 1 Wave / LFO 2 Wave / LFO 3 Wave*** - Waveform of the LFO. Multi-sine is a mix of a normal sine wave and one three times its speed.
- ***Cross Type*** - Defines whether the plugin works on the lower or higher frequency part of the signal. Process HP processes only high frequencies, Process LP processes only low frequencies.
- ***Cross Cutoff*** - Cutoff frequency of the cross-over filter.
- ***Wet Only*** - If using the chorus as a send effect, switch this parameter to mix the pure 'wet' output with the source sound.

Plugin Credits: Smart Electronix.

Fruity Compressor

Compression is one of THE most important effects in modern music. It is used to give kick drums THUMP and make bass FAT! Importantly, it can make mixes sound much louder than they are. Compression is the process of automatically adjusting the volume of the input sound so that the quiet parts are louder and the loud bits don't distort. It's like having someone automatically (and very quickly) adjusting a volume knob, keeping the volume level within a set range. The controls for this process relate to the relationship between input and output volume. The Fruity Compressor is a variable-knee compressor with built-in peak limiting.



Parameters

- ***Threshold*** - Sets the dB level at which the compressor kicks in (with a range from 0.0 to -60.0 dB). The threshold should be adjusted according to the relative input level and the type of audio material. Once the threshold level is reached, compression will start, reducing the gain of the input signal according to the current Ratio, Type, Attack and Release settings.

- ***Ratio*** - Controls the amount of compression (gain reduction) that will be applied to the signal once the threshold level is reached (with a range from 0.4:1 to 30:1). Ratio denotes the difference in dB between input level and output level, i.e. how much the signal above threshold level will be compressed (or expanded, at ratios below 1:1). For example, a ratio of 4:1 means that when the input level increases by 4dB, the output level of the signal above threshold will only increase by 1dB.

- ***Gain*** - Controls the amount of make-up gain to be added or subtracted from the compressed output signal (with a range from 30.0 to -30.0 dB). The gain should be adjusted to normalize the signal amplitude after compression, or to control the amount of limiting.

- ***Attack*** - Controls the time it takes to reach full compression once the threshold level has been exceeded (with a range from 0.0 to 400.0 ms). A fast attack setting means that compression will be more or less instant. Using a slower attack setting results in the compression being gradually increased, allowing for more variations in the signal than the fast setting. Attack should be adjusted according to the nature of the audio material.

- ***Release*** - The Release parameter sets the time the compressor takes to stop acting after the level has fallen below threshold (with a range from 1 to 4000 ms). Short release times will make the compression more flexible and able to adapt to the input signal, but can cause fast changes in gain that may sound displeasing. Longer release times produce a signal with a more even level and less distortion, but make it harder to maximize the overall compression because small variations in signal level will be ignored.

- ***Type*** - This parameter controls the knee type and TCR. The possible values are: Hard, Medium, Vintage, Soft, Hard/R, Medium/R, Vintage/R, Soft/R. The knee determines the dB range above and below the threshold where the compression goes from 1:1 to the selected compression ratio. A hard knee setting means that compression will take place immediately after the threshold level is reached, whereas a soft knee setting indicates that compression is gradually applied over a range in the signal. See Knee Type below for more information on the meaning of those values.

Knee Type

While attack decides how fast a compressor acts, the compressors knee characteristics control at what rate the full amount of compression is applied. Soft means it is a gradual increase, hard means it happens like a switch, instantly.

- ***Hard*** - 0 dB
- ***Medium*** - 6 dB
- ***Vintage*** - 7 dB
- ***Soft*** - 15 dB

The Vintage compression type emulates the compression curve found on some analog compressors, such as the classic Teletronix LA2A. The major difference is that the compression ratio is gradually reduced at a distance above threshold, slowly allowing the level to go back to a ratio of 1:1. This allows the loudest parts of the signal, such as drum beats and other peaks, to pass without being compressed as much as the rest of the signal. In this way, the Vintage compression type emulates electro-optical analog designs and can greatly enhance warmth and 'punch'.

The Vintage compression type also affects the TCR parameter, utilizing a different release time adjustment method.

The /R types enable TCR (Transient Controlled Release), a special algorithm that automatically adjusts the release time in real-time to avoid fast compression changes. The release time is adjusted in relation to the current Release parameter setting. Enabling TCR can have positive effects on some types of audio material, and help to reduce 'pumping and breathing', while increasing the overall loudness of the signal.

Plugin Credits: Ultrafunk

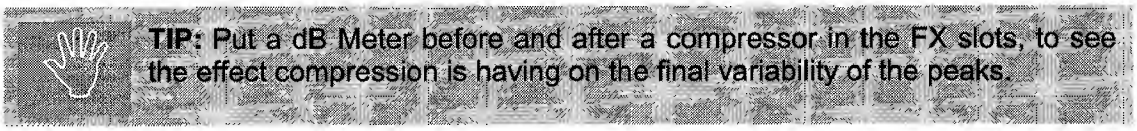
Fruity dB Meter

Similar to the 'Big Clock', this is a plugin for those with tired eyes. The Fruity dB Meter is a peak meter in a dB (decibel) format. The signal louder that 0 dB limit is displayed in orange (the peaks become red).

Hold the mouse cursor over the display to see the decibel level. Right-click it to reset the peak holds.

The Fruity dB Meter can also be set at various points in the Fx chain, to check levels before and after various FX.

Plugin Credits: Didier Dambrin


TIP: Put a dB Meter before and after a compressor in the FX slots, to see the effect compression is having on the final variability of the peaks.

Fruity Delay

Delay is another of those 'bread and butter' FX. Delay FX are echoes. Fruity Delay is a delay line plugin, with inverted stereo / ping pong modes & a lowpass filter, optimized for automation (input and feedback values are ramped).

Parameters

- ***Input*** - Sets the volume level of the input signal
- ***Feedback*** - Sets the echo volume. Set to maximum creates a constant level of feedback (i.e. echoes that do not fade out).
- ***Cutoff*** - Sets the cutoff frequency for the low-pass filter used on the echoes. Set to maximum to disable.
- ***Tempo*** - Allows you to set the tempo used to generate the echoes. Auto uses the tempo of FL Studio, the other values for this knob allow you to set a custom tempo speed to be used.
- ***Steps*** - Determines the time between each echo (default is three steps/notes).

- ***Mode*** - Allows you to set the delay filter in a special mode for processing stereo signal: Normal processes the stereo signal as in the original, Inv.Stereo swaps the right and left channels for all the echoes, Ping Pong swaps the left and right channels of the input for each echo and back (thus creating a 'bouncing' effect if the source contains panned sounds).

Notes & Tips

You may need to use Fruity Center DC offset removal when applying delay on a TS404 channel. Echoes will break up if there is tempo automation.

Plugin Credits: Didier Dambrin

Fruity Delay 2

Fruity Delay 2 is an enhanced version of the Fruity Delay VST plugin, with refined controls and some additional features, such as stereo offset and panning control for the input signal.

Parameters

- **Input Section** - Allows you to tune the volume and panning of the input signal.
- ***Panning knob*** *(PAN)* - Sets the panning of the input signal.
- ***Volume knob*** *(VOL)* - Sets the volume of the input signal.

Feedback Section

Sets various options for the echo feedback:

- ***Normal/Inverted/Ping Pong*** - Normal keeps the stereo data consistent with the input signal; Inverted switches the left and right channels in the feedback (so if the input is panned to right, the feedback will be panned to left); Ping Pong works like Inverted, but switches the left and right channels repeatedly for each echo generated (thus creating a 'ping pong' effect).
- ***Volume knob*** *(VOL)* - Sets the volume of the feedback. Setting this to maximum will create feedback that never fades out, while setting it to minimum (spun maximum to left) will result in no feedback.
- ***Cutoff knob*** *(CUT)* - Sets the cutoff frequency amount for the feedback. Allows you to 'smooth out' echoes as they fade out thus creating more natural effect.

Time Section

Contains the time settings of the delay effect:

- ***Time knob*** *(TIME)* - Sets the signal delay time, and amount of time between echoes in the feedback. This setting is tempo-based. If you want to set the time to an exact number of steps, right-click the knob and from the popup menu that appears select the Set submenu for a list of presets.

- ***Stereo Offset knob*** *(OFS)* - Lets you set a time offset for the left or right audio channel, to create a richer stereo panorama of the delay effect. To delay the left channel, turn the knob to the left. To delay the right channel, turn it to the right. To remove the time offset between channels, reset the knob (right-click the knob and select the Reset command).

Dry Section

Contains a single knob (VOL) that sets the amount of 'dry' (unprocessed) signal to be mixed with the 'wet' (processed by the effect) signal.

If you want to use Fruity Delay 2 in a send track, it is recommended to set the dry volume to 0 (the knob spun maximum to left).

Plugin Credits: Didier Dambrin

Fruity Fast Dist

Fruity Fast Dist is a CPU-friendly distortion effect. It is the same distortion effect used in the TS404 synth.

Parameters

- ***Preamp knob*** *(PRE)* - Allows you to amp up or down the signal before it is distorted. The middle position means 100% volume. You might need to increase the volume to get distortion.

- ***Threshold knob*** *(THRES)* - Selects the frequency band to be distorted. The more you turn this knob to right, the wider the band.

- ***A/B switch*** - Selects between two types of distortion.

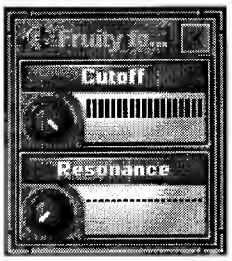
- ***Mix knob*** *(MIX)* - Allows you to mix the dry sound (unprocessed) with the distorted sound. Turn the knob maximum to the right to hear only the distorted sound.

- ***Post Gain knob*** *(POST)* - If you distort the sound too much, it will become too loud. This knob lets you reduce the volume AFTER applying the distortion. Rotated maximum to the right produces 100% sound volume.

Plugin Credits: Richard Hoffmann, Didier Dambrin.

Fruity Fast LP Filter

Fruity Fast LP is a lowpass filter with very low processor use, optimized for automation. This filter applies the algorithm used when you select 'Fast LP' filter the Instrument Channel Settings.



Parameters

- ***Cutoff*** - Sets the 'cutoff' frequency used in the filter (the higher the value, the wider the band passed through the filter).
- ***Resonance*** - Sets the filter's resonance: this is an amplified frequency band near the cutoff level used to create special effects.

Plugin Credits: Didier Dambrin

Fruity Filter

Fruity Filter is a very useful variable filter plugin, optimized for automation (level ramping).

Parameters

Cutoff Freq - Sets the cutoff frequency for the lowpass/bandpass/highpass filters.

Resonance - Boosts a frequency band near the cutoff level to create a sound 'sharpening' special effect.

Low Pass - The amount of lowpass filter mixed in the output. This filter leaves only low frequencies in the output.

Band Pass - The amount of bandpass filter mixed in the output. This filter leaves a certain frequency band in the output and filters all other frequencies.

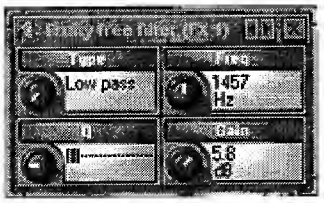
High Pass - The amount of highpass filter mixed in the output. This filter leaves only high frequencies in the output.

Plugin Credits: Didier Dambrin, David Billen (code samples).

Fruity Free Filter

Fruity Free Filter is a general purpose filter plugin.

Parameters



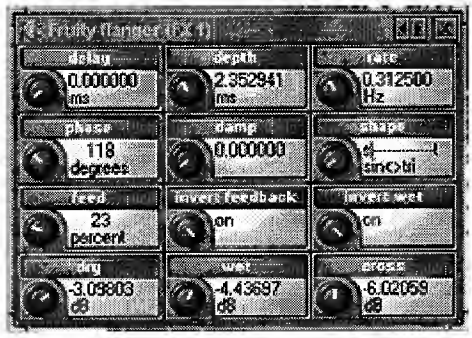
- **Type** - Selects the filter type to be used: low pass, band pass, high pass, notch, low shelf, peaking EQ & high shelf.
- **Freq** - The cutoff/bandpass/bandcut frequency (depending on the filter type setting).
- **Q** - This value has a different (or no) meaning for the different filters. 'Q' comes from the analog filters and basically means the filter's 'quality'. With high pass/low pass filters Q is better known as 'resonance', while with others it defines the ability of the filter to create sharp frequency 'rolloffs'.
- **Gain** - This settings has meaning only for 'peaking' filters and sets the filter gain. Applies to peaking EQ, low shelf and high shelf filter types.

Plugin Credits: Didier Dambrin

Fruity Flanger

Fruity Flanger is an FL Studio exclusive plugin developed by Smart Electronix. Flanging is the process of mixing a variably delayed copy of a sound with the original, causing frequencies in the two samples to reinforce and cancel each other as they drift relative to each other. This is similar to the effect of a jet passing overhead in an open space, or listening through a long tube.

Parameters



- ***Delay*** - Sets the minimal delay of the delay-line inside the flanger. The flanger delay will be swept between delay and delay+depth. Range: 0 to 20 milliseconds. For 'deep' flanger effect you should set this parameter to low values.
- ***Depth*** - Controls the range of the flanger action. The flanger delay will be swept between delay and delay+depth. If you set this value to zero, the flanger will remain 'static' as the delay will stay constant. Range: 0 to 20 milliseconds. Setting this parameter to high values will create special effects and heavy modulation.
- ***Rate*** - The rate at which the flanger is modulated. Range: 0 to 5 Hz.

- ***Phase*** - Use this control to widen the stereo image. If set to 0, the LFO on the left and right channel will be in perfect synchronization. At 180 degrees the left and right channel will be 100% out of phase. This means that the left channel will reach it's maximum when the right channel is at minimum. Range: 0 to 360 degrees. Try setting 10 degrees for subtle stereo enhancement.

- ***Damp*** – Allows attenuation of the high frequencies of the processed output. Range: 0 (no filtering), 1 (full filtering - no output).

- ***Shape*** - Determines the shape of the LFO. You can vary this between a triangle and a sine LFO. Using sine LFOs will result in smoother transitions, using a triangle will result in more constant pitch-shifting. While subtle, this can help for getting the right sound. Range: smooth transition between sine to triangle.

- ***Feed*** - Sets the feedback amount. Range: 0 to 100 %. Setting to high values to make the flanger 'whistle'. Try high settings with heavy filtering (for example 99% feedback + the filter at 0.95) for special effects.

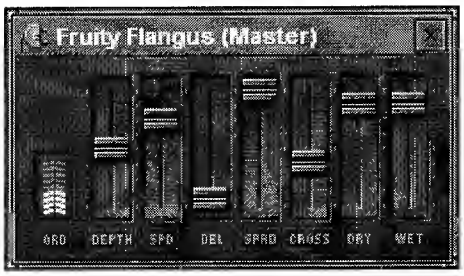
- ***Invert Feedback / Invert Wet*** - Two switches that invert the processed (wet) and feedback signal. Mixing a signal with an inverted version of itself creates the known flanger effect. When both are off the sound is more like a chorus than a flanger. While Invert Wet will directly change the flanger/chorus sound, the Invert Feedback has a less dramatic effect, but can be used to change the sound timbre. Range: on and off.

- ***Dry / Wet / Cross*** - Three knobs that determine the output mixture. Dry is the original signal, wet is the effected signal and cross is a left-right inverted version of the wet signal. Range: -inf (silent) to 0dB.

Plugin Credits: Smart Electronix

Fruity Flangus

Fruity Flangus is an advanced flanger and allows you to enrich the stereo panorama of your mix, add complex flange effects and simulate unison mode synthesis via a set of controllable 'stacked' flangers.



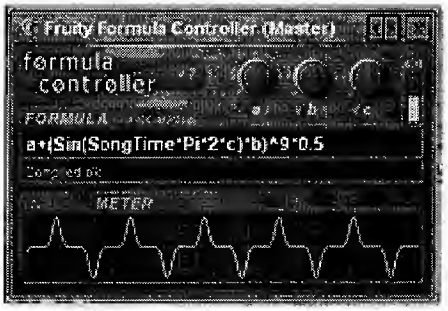
Parameters

- ***Order*** *(ORD)* - Sets the number of 'stacked' flangers to be used for the effect. Using more flangers makes the effect smoother and richer.
- ***Depth*** *(DEPTH* - Controls the 'flange depth' (amplitude of pitch oscillation for each of the stacked flangers).
- ***Speed*** *(SPD)* - Controls the flange speed (speed of pitch oscillation).
- ***Delay*** *(DEL)* - Variable amounts of delay can be applied to each of the stacked flangers. Use this parameter to define the overall amount of delay applied.
- ***Spread*** *(SPRD)* - Each flanger is assigned a different speed, depth etc. in a range defined by the basic properties provided in the Flangus interface. Increase the SPRD value to 'smooth' the spreading of the stacked flangers across the parameter ranges.
- ***Stereo Cross*** *(CROSS)* - Applies a stereo cross mix between the left and right channel audio output of Flangus. Increase the parameter value to mix more of the left channel sound in the right one and vice versa. The parameter has range of -100 to 100. Negative values mix inverted sound in the opposite channel.
- ***Dry*** - Determines the amount of mixing the input (unprocessed) audio signal in the output. The parameter has range of -100 to 100. Negative values mix inverted sound in the output.
- ***Wet*** - Determines the amount of mixing the processed ('flanged') audio signal in the output. The parameter has range of -100 to 100. Negative values mix inverted sound in the output.

Plugin Credits: Didier Dambrin

Fruity Formula Controller

Fruity Formula Controller is a controller plugin that accepts user-defined formulas. As with all internal controllers, the formula output can range from 0 to 1, using high accuracy floating point numbers.



Parameters

- ***Knob A/B/C*** - Three knobs that can be used as custom parameters in your formulas. You can access their values via the A, B and C variables (see list of available objects and functions below).
- ***Out*** - Displays the current formula value (empty bar is 0, full bar is 1). To see how the formula output develops in time, use the Meter view (see below).

- ***Formula*** - Type here the formula to be used. Press ENTER key to compile to formula. If the formula is a valid math expression, you will see a message 'Compiled OK' below the formula. Otherwise, you will see an error message explaining where the mistake is.
- ***Compile*** - An alternative to pressing ENTER in the formula edit box, click here to compile the formula.
- ***Info*** - Click INFO to see the formula description written by the author. The text is editable and supports rich text formatting (you can paste rich formatted text from WordPad).
- ***Meter*** - Click METER to see a graph displaying the formula output in time. This is a very helpful view, especially when programming LFO units.

See next page for controller syntax.

Operators		
Operator	**Comment**	**Syntax**
+	addition	a+b
*****	multiplication	a*b
-	subtraction	a-b
/	division	a/b
^	power	a^b
Functions		
Operator	**Comment**	**Syntax**
Sin	sine	Sin(a)
Cos	cosine	Cos(a)
Tg	tangent	Tg(a)
Ctg	cotangent	Ctg(a)
Sec	secant	Sec(a)
CoSec	cosecant	CoSec(a)
ArcSin	antisine	ArcSin(a)
ArcCos	anticosine	ArcCos(a)
ArcTg	antitangent	ArcTg(a)
Exp	exponent	Exp(a)
Sqrt	square root	Sqrt(a)
Ln	logarithm base e	Ln(a)
Log10	logarithm base 10	Log10(a)
Log2	logarithm base 2	Log2(a)
Neg	negative	Neg(a)
Abs	absolute	Abs(a)
Pi	pi	Pi()
Sum	sum of arguments	Sum(a,b)
Min	minimum	Min(a,b)
Max	maximum	Max(a,b)
Round	round to nearest integer	Round(a)
Int	integral part	Int(a)
Frac	fractional part	Frac(a)
IfE	returns 1 if a=b	IfE(a,b)
IfL	returns 1 if a<b	IfL(a,b)
IfG	returns 1 if a>b	IfG(a,b)
IfLE	returns 1 if a<=b	IfLE(a,b)

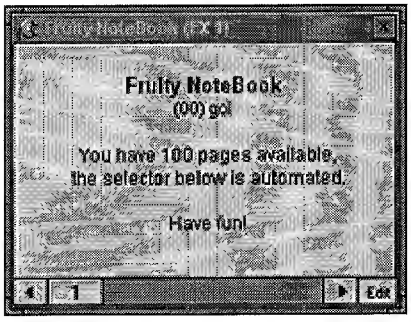
Functions		
IfGE	returns 1 if a>=b	IfGE(a,b)
Case	returns b if a=1, else returns c	Case(a,b,c)
Rand	random value (0..1)	Rand()
SeededRand	random value (0..1)	SeededRand(Seed)
Special (related to FL Studio)		
Operator	**Comment**	**Syntax**
a	a knob's value	a
b	b knob's value	b
c	c knob's value	c
SongTime	song position, in quarters	SongTime()
Time	system time, in ms	Time()
Tension	same as tension knobs	Tension(Value,Speed)
Gadgets		
Operator	**Comment**	**Syntax**
Date	system date	Date()
MouseX	mouse cursor X position	MouseX()
MouseY	mouse cursor Y position	MouseY()

The table above shows functions and objects supported by the Formula Controller.

Plugin Credits: Didier Dambrin, Andrew Tumashinov (RapidEvaluator)

Fruity NoteBook

Fruity NoteBook is a 100-page notepad, useful for song information, story, lyrics or personal notes. It supports RTF data. You can paste different formats from rich text editors, such as WordPad, but not pictures.



The page number selector (1 at the bottom of the picture below,) is automatable, so you can synchronize the pages with a song.

To automate the notebook in time with a song **use an automation clip to turn the pages**, the number slider at the bottom may be linked to an automation clip. You will need to create steps in the clip where you want the pages to increment.

Plugin Credits: Didier Dambrin

Fruity HTML NoteBook

Fruity HTML NoteBook is an HTML viewer plugin, useful for adding information to a song, using the richness and power of HTML. Unlike the Fruity NoteBook, this plugin doesn't save the HTML document in the project file, so be sure to bundle the full HTML document with your project if you distribute it.

Plugin Credits: Didier Dambrin

Fruity LSD

Fruity LSD wraps the functionality of the DirectMusic software synthesizer to FL Studio and provides sixteen MIDI instruments with an option to import DLS level 1 banks.

Since this is a software synthesizer, you can process its output with effects as with any generator. The difference from an usual generator, however, is that the Fruity LSD itself is a combination of sixteen instruments (fifteen instrument channels and a drum channel /10/, as in a standard MIDI interface).

You should think of Fruity LSD not as a generator, but as a virtual software MIDI device, that can also be attached as an effect in a mixer track. You can control its sixteen channels with MIDI Out generators added into the Step Sequencer, just as with a normal MIDI device. Set the same MIDI port in the LSD plugin and the MIDI Out channels you will use. You can set the patch name and

bank number from the MIDI Out channels as well, but since this may be confusing when using custom DLS banks (the MIDI Out channels will display only standard MIDI instruments names), it is recommended that you set the patch from the Fruity LSD editor directly.

Main Parameters

- ***Bank*** - Lets you set the DLS bank to be used for synthesis. Click the browse button to select a DLS file. By default, Fruity LSD uses the Roland GM/GS Sound Set (which is default for the DirectMusic synthesizer as well and is usually located in '<windows directory>/System32/GM.DLS'). The DLS file used is not included in the FLP file, but stored as a path instead.
- ***Port*** - Sets the MIDI port number from where Fruity LSD will receive MIDI events (notes, volume changes etc.). You should set the same port in the MIDI Out channels that will be used to control the Fruity LSD. It is recommended that you avoid using port 0 with Fruity LSD, since this port is set for the main MIDI playing output in the MIDI Settings page.
- ***Channels List*** - A list of the sixteen channels of the LSD with the patch names. Click on a name to select a different instrument for the channel. Channel 10 holds the drum section.
- ***Main Volume*** - Sets the main volume of the LSD output. This parameter is automatable.

Additional Parameters

- ***Device*** - Sets the DirectMusic compatible MIDI device to be used for synthesis. Hardware MIDI devices are filtered in Fruity LSD, since their output cannot be routed to FL Studio.
- ***Reverb*** - Turns on/off the global reverb effect.
- ***Chorus*** - Turns on/off the global chorus effect. Chorus is not supported in the built in Microsoft Synthesizer. However, it is included for compatibility with 3rd party DirectMusic engines, that may be used with Fruity LSD.

Notes & Tips

You need DirectX 8 or later installed on your system for the Fruity LSD to function properly. Pan, filter cutoff and resonance per note (in the graph edit or the piano roll) are not supported. The MIDI standard only supports velocity per note.

At low volume, you may notice some noise in the Fruity LSD sound (you can hear it clearly on decaying note if you put a compressor after it in the FX track). This is not caused by the Fruity LSD plugin itself, but by the DirectMusic synthesizer. You can partially fix this problem with a Fruity Filter or equalizer (to cut very high frequencies of the output).

There are many tools that allow you to create custom LSD banks. LSD supports samples, per region envelopes, and LFOs etc. With tools such as Awave, you can also take advantage of hundreds of freeware SF2 (SoundFont) banks found on the Internet by converting them to LSD format.

Plugin Credits: Didier Dambrin. Thanks To: Chris Moulios for the source code.

Fruity Mute 2

Fruity Mute is a simple plugin to automate mutes in FL Studio mixer chain.

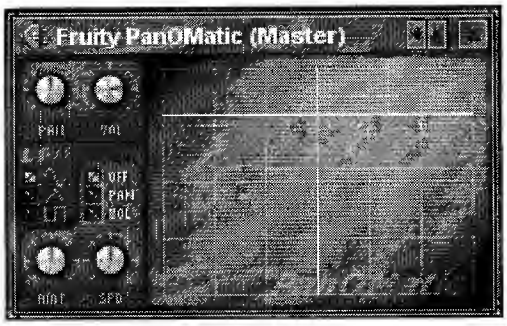
Parameters

- ***Mute*** - Turns the sound on/off.
- ***Channel*** - Allows you to select both channels (left & right) for muting, or only one of them.

Plugin Credits: Robert Conde.

Fruity PanOMatic

Fruity PanOMatic is a panning and volume plugin, especially useful for automation.

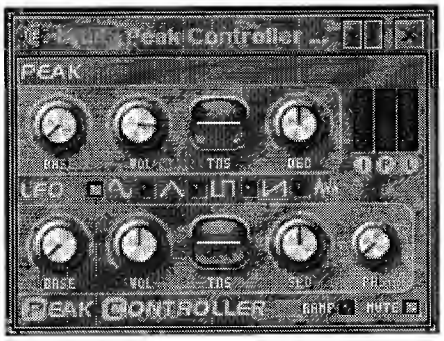


This plugin uses level ramping/smoothing to avoid clicks and pops, and includes a handy volume/pan grid (drag the cross with your mouse) and an adjustable LFO unit.

Plugin Credits: Didier Dambrin.

Fruity Peak Controller

Fruity Peak Controller generates an automation signal on the basis of an input sound. It is similar to a noise gate, however this plugin has a built-in LFO, and greater flexibility.



- ***Peak Ctrl*** **- LFO** - An LFO controller.
- ***Peak Ctrl*** **- Peak** - The value of this controller is based on the volume peaks of the input audio signal received by the plugin.
- ***Peak Ctrl*** **- Peak+LFO** - The sum of the LFO and Peak controllers.

To use this plugin, place an instance of it in the Mixer track where is the signal you want to use as a 'peak source'. If you want the input signal the plugin receives to be affected by some of the plugins in the same track, put the Peak Controller after them.

Parameters

Peak Section

Sets the options for the peak controller:

- ***Base knob*** *(BASE)* - Sets the base value (offset) of the peak controller.
- ***Volume knob*** *(VOL)* - Sets how the volume peaks affect the peak controller. Values range from -200% (maximum left) to 200% (maximum right). When using positive values for this setting, higher volume means higher value for the peak controller. Negative values result in the opposite effect.
- ***Tension*** *(TNS)* - Drag up and down to alter the shape of the curve used to map the volume peaks to peak controller values. Think of this as the peak 'tension'.
- ***Decay knob*** *(DEC)* - Turn to right for faster decay of the peak, or left for slower decay.

LFO Section

Sets the options for the LFO controller.

- ***LFO Shape*** – A set of radio buttons (at top of this section), that allow you to set the shape of the LFO. Available choices are sine, triangle, square, saw and noise (random values).
- ***Volume knob*** *(VOL)* - Sets the amplitude of the LFO. Values range from -100% (maximum left) to 100% (maximum right). When using positive values, the LFO value is added to the base value. For negative values, the LFO value is subtracted from the base value.
- ***Tension*** *(TNS)* - Drag up and down to alter the shape of the curve used to map the LFO values to LFO controller values. Think of this parameter as LFO 'tension'.
- ***Speed knob*** *(SPD)* - Sets LFO speed. Turn to left to speed up the LFO, or right to slow it down.
- ***Phase knob*** *(PHS)* - Sets LFO phase offset. Use to adjust the start position of the LFO.

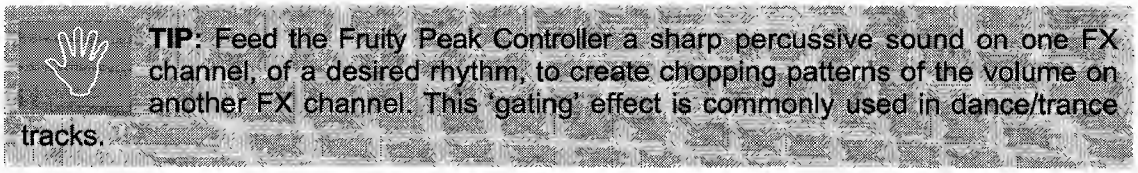
Additional Options

- ***Ramp switch*** - Prevents abrupt changes in controller values. Turn on if the parameters you link cause clicks and pops when changed too fast.

- ***Mute switch*** - When turned off, the signal passes through the Fruity Peak Controller plugin. When turned on, the output of the plugin is muted. Turn on when the input signal is used only to generate peaks for the Fruity Peak Controller, and you don't want to hear it in the final composition.

Monitor Scales

In the top right corner of the editor window you will see three scales. The input monitor (marked 'I') shows the value of the volume peaks detected in the input signal. The peak output monitor (marked 'P') shows the value of the resulting peak controller. The LFO output monitor (marked 'L') shows the value of the LFO controller.

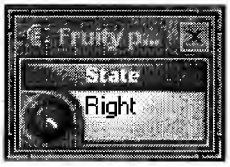


TIP: Feed the Fruity Peak Controller a sharp percussive sound on one FX channel, of a desired rhythm, to create chopping patterns of the volume on another FX channel. This 'gating' effect is commonly used in dance/trance tracks.

Plugin Credits: Didier Dambrin.

Fruity Phase Inverter

Fruity Phase Inverter is a simple plugin that inverts the phase of either the left or right channel, giving a surround effect. Phase is the direction the sound wave is moving in at any time. Be careful, as inverted waves can cancel each other, especially if the output is converted to mono.

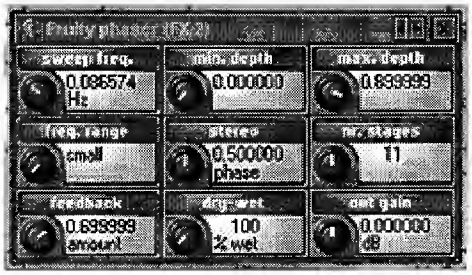


This plugin is provided for backwards compatibility since the global surround effect provided in earlier releases of FL Studio has been removed.

Plugin Credits: Didier Dambrin.

Fruity Phaser

Fruity Phaser is an FL Studio exclusive plugin based on SupaPhaser, a plugin developed by Smart Electronix. Phasing is closely related to flanging. Various frequencies in the original signal are delayed by different amounts, causing peaks and troughs in the output signal which are not spaced evenly. Phasing and flanging sound similar, as both come from combining delayed versions of the signal with the original. However, the Phasing effect is significantly more intense, with a greater 'sweeping' effect across the spectrum.



Parameters

- ***Sweep Frequency*** - Sets the frequency of the LFO which controls the phaser. The range depends on the Frequency Range parameter. If the value for that parameter is large, Sweep Frequency will change the frequency between 0 and 10Hz. If the range is small, it will change the frequency between 0 and 2Hz.
    - ***Min and Max Depth*** - Controls the range of the phaser action. The phaser will be swept between these values.
    - ***Frequency range*** - Sets the frequency range using for the Sweep Frequency parameter.
    - ***Stereo*** - Use this control to widen the stereo image. If set to 0, the LFO on the left and right channel will be in perfect synchronization. At 180 degrees the left and right channel will be 100% out of phase. This means that the left channel will reach maximum when the right channel is at minimum. Range: 0 to 360 degrees. Try setting to 10 degrees for subtle stereo enhancement.
    - ***Stages*** - Controls the number of phasing stages. Old stompbox phasers usually have four or six stages, but this digital equivalent can have up to twenty-three stages. As the number of stages rises, the effect becomes more pronounced.
    - ***Feedback*** - Determines how much of the signal is sent back into the phaser.
    - ***Dry-Wet*** - Sets the mixture of processed and non-processed sound.
    - ***Out-Gain*** - Sets the additional gain for the signal at the output of the effect. Use this parameter to boost silent signals.

Plugin Credits: Smart Electronix

Fruity Reverb

Reverb, short for reverberation, simulates acoustic spaces. If you clap your hands in a bathroom or concert hall, the sound is quite different. This is due to the fact that in enclosed spaces reflections build up and overlap to create the 'reverberant' sound. Fruity Reverb parameters allow you to simulate different types of acoustic spaces.

Fruity Reverb is an FL Studio exclusive plugin based on fx:reverb, a part of Ultrafunk's Sonitus:fx DirectShow audio plug-in package. Other plug-ins included in the pack are fx:equalizer, fx:modulator and fx:phase.

Parameters

- ***Low Cut*** - Adjusts the low cutoff frequency. Use to remove low frequencies from the input signal before reverb is added. For e.g. when adding reverb to a drum track, you might want to remove some of the 'rumble' from the bass drum by attenuating the bass frequencies. Setting this parameter to the minimum value will bypass the Low Cut filter, displaying OFF in the value field.

- ***High Cut*** - Similar to Low Cut. Adjusts the high cutoff frequency. Use to remove high frequencies from the input signal.

- ***Predelay*** - Controls the delay time between the direct input signal and the first reverb reflection. Set to modest values for small rooms, and increased relative to room size. Predelay creates a slap-back echo effect that can add atmosphere and muffle the signal, so use it wisely.

- ***Room Size*** - Sets the size of the virtual room where the reverb is created. Adjust according to decay time. Small rooms sound better with a short decay time, large rooms with longer reverb times.

- ***Diffusion*** - Controls the density of the reflections bouncing off the walls of the virtual room. A low diffusion setting makes the reflections sound more distinct, like closely spaced echoes. A high diffusion setting creates reflections so close they sound more like noise, where echoes are indistinguishable.

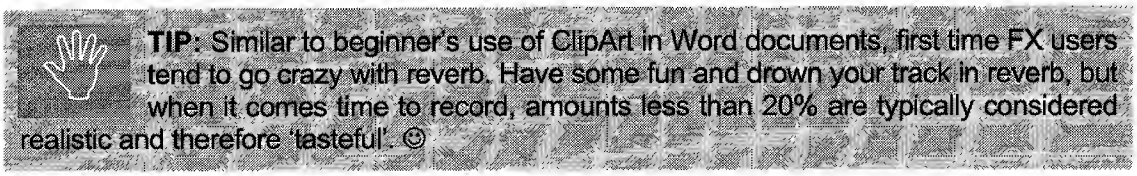
- ***Color*** – Use to adjust the decay time of the bass frequencies of the signal. Color has five settings: Brighter, Bright, Flat, Warm, Warmer. Allows you to change the overall perceived mood, or 'sound' of the virtual room. A bright room has a low bass response, while warm rooms have a higher bass response. In a flat room, the response of the bass is equal to the general frequency response.

- ***Decay*** - Controls the decay time of the reverb, the time it takes for the signal to decay to -60dB (1/1000 of the maximum amplitude). Use low decay times for small rooms or boxes, and long decay times for large rooms, halls or churches. You should also make sure that the Room Size parameter has an appropriate value.

- ***High Damping*** - Allows you to adjust damping of the high frequencies in the reverb signal over time. Damping refers to the high frequencies being attenuated and dying out. This causes the sound to become gradually muffled and warm like it is being absorbed in the room. Setting this parameter to the maximum value will bypass the High Damping, displaying OFF in the value field.

- ***Dry*** - Sets the relative dry output level.

- ***Reverb*** - Sets the relative reverb (wet) signal level.


TIP: Similar to beginner's use of ClipArt in Word documents, first time FX users tend to go crazy with reverb. Have some fun and drown your track in reverb, but when it comes time to record, amounts less than 20% are typically considered realistic and therefore 'tasteful'. ☺

Plugin Credits: Ultrafunk.

Fruity Scratcher

Fruity Scratcher is a vinyl turntable simulator. You can load any sample that FL Studio supports, and record your performance in real-time. **A closely related plugin is the WaveTraveller (see page 176)**. You can adjust the turntable's acceleration, weight etc. to suit your needs.

Parameters

- ***Smooth*** *1/2/3/4* - Four parameters that control the 'gradient' generation of the turntable simulator. Adjusting these values can lead to better result with certain types of source material.
- ***Pan*** - Sets the stereo panning of the audio output.
- ***Vol*** - Sets the volume of the output.
- ***Hold*** - Stops the turntable from playing.
- ***Mute*** - Mutes the sound of the turntable (suitable for automation).

- ***Turntable*** - Left-click and drag up/down to scratch the sample.
- ***Play Backwards*** - Press to play the sample backwards when not scratching.
- ***Pause*** - The turntable stays still when not scratching.
- ***Play Forward*** - Press to play the sample forward when not scratching.
- ***Speed*** *(SPD)* - Lets you adjust the playback speed (default: 1x).
- ***Acceleration*** *(ACC)* - Lets you adjust the motion acceleration for the turntable.
- ***Sensitivity*** *(SEN)* - Adjusts the turntable's sensitivity to mouse movement. The lower the sensitivity, the slower the rotation from the same mouse movement.
- ***Browse for Sample*** - Click to select a sample as the source material to be 'scratched'.
- ***Wave Preview*** - Displays a preview of the sample.

Plugin Credits: Robert Conde.

Fruity Send

The Fruity Send plugin allows you 'siphon off' a copy of the sound from any point in the mixer channel FX stack, to one of the four Send mixer tracks. This differs from the Send knob that takes the sound from the end of the FX stack.

NOTE: This plugin cannot be inserted in the master channel OR any of the send channels.

Plugin Credits: Didier Dambrin

Fruity Soft Clipper

Fruity Soft Clipper is a CPU-friendly soft limiter filter, that allows you to avoid clipping and distortion by applying soft compression to the input signal. The graph on the plugin shows input (horizontal axis) vs output (vertical axis). You can see in the example on the left, that after the threshold level (horizontal line) the output volume per unit of input decreases.

Parameters

- ***Threshold*** *(THRES)* - The volume threshold, above which Soft Clipper will compress the audio signal.
- ***Post Gain*** *(POST)* - Volume level applied after the compression.
- ***Output Meter*** - Displays the output volume levels of the plugin.
- ***Levels display*** - Displays the compression settings (hold your cursor over the display to see input to output levels mapping in the hint bar). Drag the cursor in the display to **change the compression threshold.**

Plugin Credits: Didier Dambrin

Fruity Spectroman

Fruity Spectroman is spectrum analyzer plugin. Insert it into the mixer track you wish to produce a spectrograph of. A spectrograph is a rolling display of the intensity of the frequencies in the sound over time. Low frequencies are plotted on the left through to high frequencies on the right. The louder the particular frequency the brighter the trace on the screen. This is useful (when mixing) for checking the frequency distribution of your mix....and be sure to have one running if anyone is watching, it makes you look like you know what you are doing ☺

Parameters

- ***Stereo*** – Shows the L and R channels together
- ***Amplitude*** *(AMP)* – Affects the intensity of the display.
- ***Scale*** – Expands and contracts the frequency range of the horizontal axis.

Plugin Credits: Didier Dambrin. FFT analysis by FFTW library (www.fftw.org/).

Fruity Stereo Enhancer

Fruity Stereo Enhancer contains various filters and processors to alter and enrich the stereo image of the input sound.

Parameters

- ***Stereo Separation knob*** *(STEREO SEP)* - This parameter lets you increase or decrease the stereo separation of the input signal. It won't have effect in mono input. The value ranges from 0% (turned maximum to right) to 200% (turned maximum to left). At 0% separation the signal becomes mono, at 100% the stereo image remains unaltered.

- ***PRE/POST switch*** - Lets you choose if you want the phase offset effect applied before the other filters in that plugin (PRE) or after the other filters (POST).

- ***Invert switch*** - With this filter you can invert the phase in one of the audio channels. NONE disables the effect, LEFT inverts the left audio channel, RIGHT inverts the right audio channel.

- ***Panning knob*** *(PAN)* - Lets you set the panning of the output. When used with small delays, the phase offset effect can make the sound seem panned to left or right. Then you can use this knob to compensate for this effect.

- ***Volume knob*** *(VOL)* - Lets you set the volume of the output. In some cases the stereo separation filter may decrease on increase the volume of the output, then you can use this knob to compensate for this effect.

Plugin Credits: Didier Dambrin

Fruity Vocoder

Fruity Vocoder is an advanced real-time vocoder effect with a wide range of adjustable parameters and zero latency. Vocoding is the process of using the frequency spectrum of one sound to modulate the same in another. When a human voice is used to modulate a synthesized chord, for example, it can sound like the synthesizer is talking (a classic robot voice from sci-fi).

The vocoded sound is referred to as a carrier. The sound used for vocoding is called a modulator. A classical example is having a voice as a modulator and a synth as a carrier, to create the effect of a 'speaking synth'.

The vocoder works by detecting the levels of certain frequency bands and then filtering the carrier. Thus the carrier takes on the characteristics of the modulator sound.

In this vocoder plugin, **the left channel is considered modulator by default**, and **the right one, carrier** (i.e. **the vocoder can process only mono sounds**). The channel assignment can be changed from the MIX section. There are many ways to create that combination, for e.g., using panning, single channel mute, Fruity Send effect, insert tracks chaining (FL Studio Producer Edition only), etc.

NOTE: The Fruity Vocoder uses the Left and Right channels of the mixer channel in which it is placed for different purposes. **Pay attention,** or you may become quite confused. One channel is the source to be Vocoded; the other is a modulator for the Vocoder algorithm.

Parameters

FREQ section

- ***Min/Max*** - Sets the frequency range processed in the vocoder. Cutting off high and low frequency regions that are not present in the modulator sound helps you achieve higher quality result with less bands.
- ***Scale*** - Lets you adjust the scale of the frequency (linear or logarithmic). The best value for this property varies with the type of modulator sound (voice, instrument, noise etc.).
- ***Invert (INV)*** - Inverts the modulator frequencies.

- ***Bandwidth*** *(BW)* - Sets the bandwidth of the bandpass filters used to filter the carrier sound. Think of wider bands as producing softer sound. The optimal value depends on the source sound.

ENV Section

Sets the envelope follower attack and decay. These is the fade in/out times for the envelopes of the frequency bands tracked in the modulator sound.

- ***Attack*** - Sets the 'fade in' time.
- ***Decay*** - Sets the 'fade out' time.

MIX Section

Allows you to mix the source sounds of the carrier and modulator in the final result (use the sliders), or hear the left (modulator) or right (carrier) channel soloed (click the LCD switches).

You can swap the left and right channels assignments (decide whether the modulator is taken from the left and the carrier from the right one or vice versa) by clicking the L and R labels at the top.

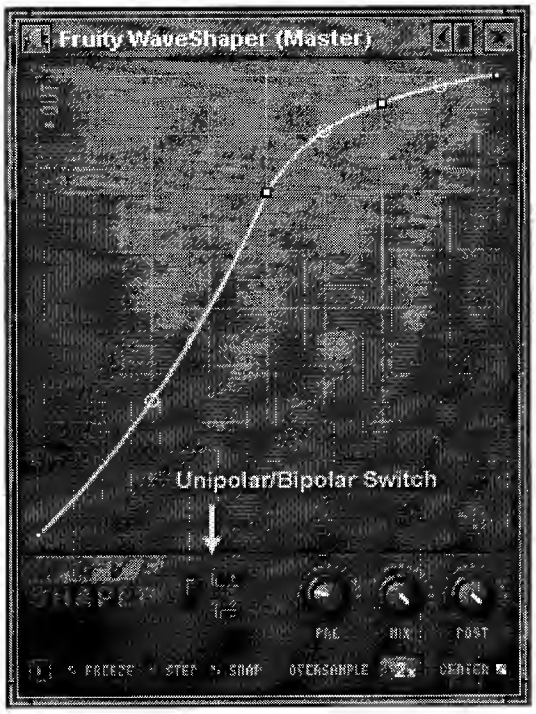
Bands Display

Displays the frequency bands, and their set volume and playback levels. Adjust the volume of the individual bands by dragging the sliders up/down.

- ***HOLD*** - Press to hold the current band levels (i.e. 'pause' the vocoder's band volume detection). You can automate this switch.
- ***Bands*** - Allows you to select between four and 128 bands to be vocoded. The more the bands, the higher the output quality. Note that more bands consume more processor power. Also note that unlike FFT-based vocoders on the market, which usually use 256, 512 or more bands, Fruity Vocoder uses a more precise detection system, so you can achieve better results with fewer bands and wihout latency.
- ***Filter*** - Allows you to set the filter order. Higher order allows for 'steeper' frequency band edges.

Plugin Credits: Didier Dambrin

Fruity WaveShaper



Fruity WaveShaper is a wave distortion effect which maps input (horizontal axis) to output (vertical axis) values using flexible spline-based graph.

Effect Parameters

- ***Unipolar/Bipolar Switch*** - When you select unipolar mode, the bottom of the graph corresponds to 0db input and the top corresponds to maximum; Bipolar is aware of the exact position of the sample (above or below DC), so the middle is mapped to DC (0db) and up and down correspond to the offsets in both directions.
- ***Pre*** - Preamplifies the input signal (volume).
- ***Mix*** - Lets you mix the input signal with the processed signal in the final output. Turning to right mixes more signal from the processed version.
- ***Post*** - Postamplification of the sound (volume).
- ***Oversample*** - Oversamples the input to the factor specified, applies the distortion and downsamples. Oversampling helps to avoid any aliasing artifacts.
- ***Center*** - Turn on to remove DC offset from the final output.

Spline (Shape) Editing Parameters

- ***Freeze*** - Enable this switch to lock the map curve to its current setup. This feature is helpful after you finish with the changes to the shape and you want to protect it from accidental edits (it also hides the handles providing a clear view of the shape).
- ***Step*** - Enable this option to set the editor in step editing mode - drag in the editor to create a 'free hand' curve where a new control point is defined for every step in the timeline. Hold SHIFT key while dragging to draw 'pulse' lines (straight vertical/horizontal lines only). Note that each new segment created this way uses the last tension set while adding a segment.
- ***Snap*** - Enable this option if you want the control points to snap to the nearest step in the graph while dragging.

Curve Editing

Here are several basic operations you can perform to edit the envelope/mapping shape:

- ***Add a new Control Point*** - Position your cursor over the line until the add point cursor appears (). Right-click and a new point will be added.
- ***Reposition a Control Point*** – Use left mouse button to drag points. Hold SHIFT while dragging to lock vertical position or CTRL to lock horizontal position.
- ***Delete a Control Point*** - Right-click a control point and select Delete. Alternatively, hold ALT and left-click.
- ***Change Segment Type*** - WaveShaper offers three types of spline segments. Right-click a control point to select spline type options (the affected segment will precede the control point): Single Curve - the default mode allows you to create linear, ease in and ease out curves (depending on the tension); Double Curve - allows linear, ease in-out and ease out-in curves (depending on the tension); Hold - creates 'hold' or 'pulse' curves which are handy for creating abrupt value changes in the envelope.
- ***Change Segment Tension*** *(Acceleration)* - You can drag the tension handle of each spline up/down to change the spline appearance. Right-click the handle to reset to a straight line. Hold CTRL during adjustment to fine tune.

Plugin Credits: Didier Dambrin.

Fruity X-Y Controller

The Fruity X-Y controller is an internal controller plugin which allows you to use your mouse (or joystick) to generate two smooth controller inputs.

X-Y Ctrl - *X* - Value depends on the X (horizontal) position of a target (small circle with a cross) in a 2D grid.

X-Y Ctrl - *Y* - Value depends on the Y (vertical) position of the target.

To use this plugin, place an instance of it in any effects track. Open the editor window. You can see the target in the middle of a 2D grid. Drag in the grid to change the goal position and the target will follow. The X and Y controller values also change according to the target movement, reaching minimum at the bottom left corner of the grid and maximum at the top right corner.

You can also control the target with a joystick. You may find Logitech's Wingman Rumblepad especially useful, because of its two analog controllers that allow you to control two instances of the X-Y controller.

NOTE: The X-Y controller allows you to **use your mouse** to smoothly control up to two variables for linking as controller sources inside FL Studio. You will see the **X-Y control (channel name) X** and **Y** as linking options when you use this FX.

Parameters:

X/Y Setup Section

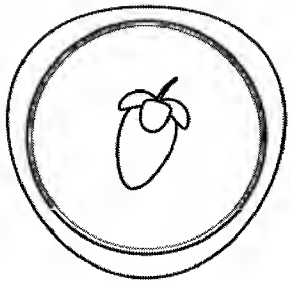
Contains options for the X/Y axis interpreting and goal position.

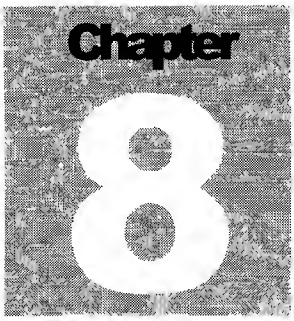
- ***X/Y switch*** - If you select X, the rest of the controls in that section control the behavior of the X axis, of you click Y, they control the behavior of the Y axis.
- ***Level knob*** *(LVL)* - Sets the X or Y (depending on the X/Y switch) goal position the target is moving to.
- ***Minimum Value knob*** *(MIN)* - Sets the value of the X or Y (depending on the X/Y switch) controller when the X/Y coordinate of the target is at its minimum.
- ***Maximum Value knob*** *(MIN)* - Sets the value of the X or Y (depending on the X/Y switch) controller when the X/Y coordinate of the target is at its maximum.
- ***Tension*** *(TNS)* - Drag up and down to alter the shape of the curve used to map the coordinate values to controller values. Think of this parameter as controller 'tension'.

Additional Options:

- ***Speed knob*** *(SPD)* - Turn to right to speed up target's movement toward the goal position. Turn to left to slow down the target.
- ***Acceleration knob*** *(ACC)* - Sets the acceleration of the target when the goal position changes. Turning to right for greater acceleration, or left for less acceleration (i.e. responsiveness of the motion).
- ***Enable Joystick Controller*** - Turn on this switch if you want to use your joystick to control the target.
- ***X and Y buttons*** - Click to launch menus where you can choose what properties of your joystick should control the X and Y axes.
- ***Joystick Speed knob*** *(SPD)* - Sets the speed of the joystick.

Plugin Credits: Didier Dambrin.





'A gentleman is a man who can play the accordion but doesn't'.
Unknown

The Playlist

The Playlist is the heart of the arranging and track-length audio recording process in FL Studio. The Playlist window contains the sequence of patterns in the upper section and audio/ automation tracks in the lower section. This is literally the place where you can construct your song from audio building-blocks. Let's take a moment to consider each space -

Pattern Tracks (Upper Playlist, area 6, see picture next page)

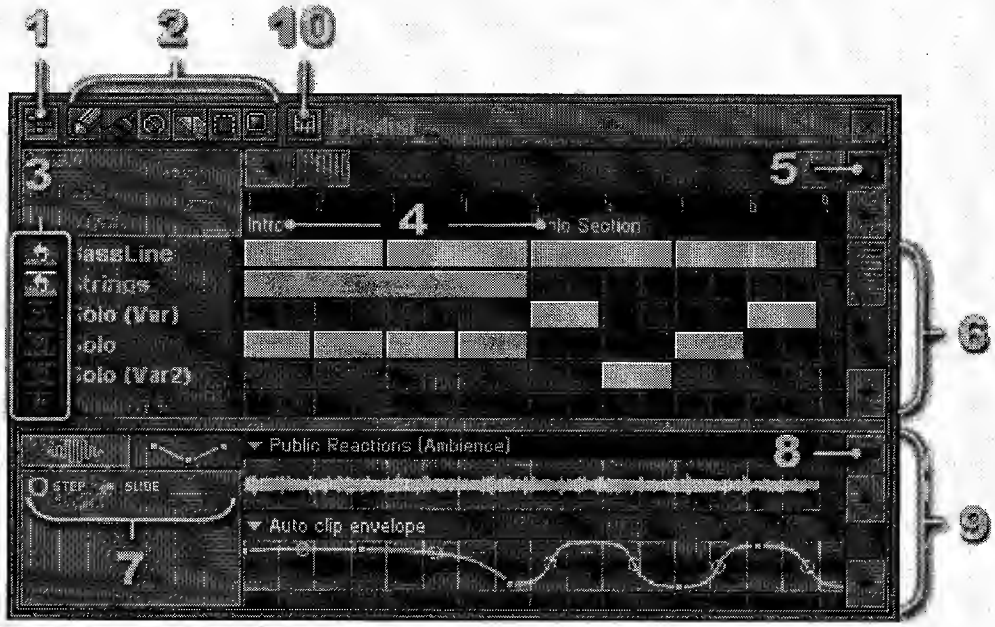
The upper part of the part of the Playlist is where **pattern blocks** are placed (left click to place, right click to delete). Pattern blocks can be repeated to speed composition (that's the purpose of this design). Each track corresponds to a pattern, so only one pattern type can be used on each track. **It is possible to record directly into the pattern area** of the Play list:

1. Place an empty pattern block in a track (left click in the desired grid location).
2. Set FL Studio to **Song Mode**
3. Start recording. When you press stop the pattern block will stretch to fill the length over which you have recorded.

Both note and automation (automation event) data may be recorded in this way. **Patterns may also be renamed** (right click on the pattern name), **colored** (left click on the small box at the end of the naming pop-up window) **and reordered** (click on the pattern name so the track turns orange and hold the ALT key and up/down arrows on the number pad).

Audio Clips and Automation Clips (Lower Playlist, area 9)

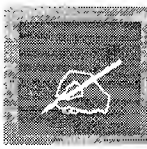
These two data types share the same (lower) part of the Playlist window but have quite different purposes. **Audio Clips** as their name suggest contain audio information and show a sample laid out across the song time-line. **Automation clips**, on the other hand, contain automation data (information that controls how knobs or sliders they are linked to move). Automation clips do not make any sound of their own. Automation clips may be laid on top of Audio clips (and each other) to more clearly show the relationship between the audio and automation linked to some aspect of the Audio Clip playback.



1. Play list Menu Button
2. Toolbar:
   - Draw (Ctrl P)
   - Paint (Ctrl B)
   - Erase (Ctrl D)
   - Cut (Ctrl C)
   - Select (Ctrl E)
   - Zoom to selection (Ctrl I)
3. Live mode switch
4. Horizontal Zoom (Timeline Zoom)
5. Time Markers
6. Patterns Tracks
7. Tracks Tools and Options
8. Audio/Automation Tracks Vertical Zoom
9. Audio/Automation Tracks
10. Local snap

Timeline and Time Markers

The horizontal dimension in the Playlist represents time. You can see the timeline displayed on top of the Playlist window (4). The numbers in the timeline stand for the number of bars since the start of the song.



NOTE: Automation events are an alternative to **Automation clips**. The main difference is that Automation events may be used to capture live tweaks and the data is stored within pattern blocks. See page 241.

You can **add named time markers** in the timeline, which help mark a specific section of your song, and allow quick selection of a region between two markers.

To add a new time marker, open the Playlist menu (1) and select Add Time Marker. Type a name for the marker and press Enter. All new markers appears at the start of the timeline. You can move them easily to any position by dragging their left edge with your left mouse button.

You can right-click any existing time marker for a popup menu enabling you to change its name or remove it.

Selection Methods

There are several ways to make a selections in the Playlist:

- ***Select rectangular area:*** in the audio or pattern tracks: In draw ( ) or paint () mode, hold Ctrl and drag an to define the selection area with the left mouse button. You can use left mouse button without Ctrl in selection mode ( ).
- ***Add to existing selection:*** Hold Shift and Ctrl while making a rectangular selection to add to the existing selection.
- ***Select a set of pattern tracks:*** Hold Ctrl and drag up/down inside the pattern name are on the left side of the screen.
- ***Select a time region:*** Hold Ctrl and drag left/right inside the timeline (4) area.
- ***Select a marked time region:*** Double-click a time marker in the timeline to select the time region from this marker to the next one (or to the end of the song in case it is the last one).

Playlist Menu

The Playlist menu button (1) shows a menu of several useful commands for managing the Playlist.

1. Edit

- ***Cut*** *(Ctrl+X)* - Cuts all selected pattern bars and audio clips to the clipboard.
- ***Copy*** *(Ctrl+C)* - Copies all selected pattern bars and audio clips to the clipboard.
- ***Paste*** *(Ctrl+V)* - Pastes pattern bars and audio clips from the clipboard.
- ***Delete*** *(Del)* - Deletes all selected pattern bars and audio clips.
- ***Delete All*** *(Ctrl+Del)* - Deletes all pattern bars and audio clips.
- ***Select All*** *(Ctrl+A)* - Selects all pattern bars and audio clips.
- ***Invert Selection*** - Inverts the selection.
- ***Quick Quantize*** *(Alt+Q)* - Applies basic quantize to all selected pattern bars and audio clips depending on the global snap setting in the Recording panel (if nothing is selected, applies to all).
- ***Insert Space*** *(Ctrl+Ins)* - Creates empty space that matches the current selection start and length by shifting all following pattern blocks forward.
- ***Delete Space*** *(Ctrl+Del)* - Erases all pattern blocks in the current selection and shifts back the remaining blocks to close the gap.

2. Patterns

- ***Set Name*** - Opens a name popup allowing you to rename the selected pattern.
- ***Color Selected*** *(Alt+C)* - Opens the standard Windows color picker, enabling you to select a color for the selected pattern track.
- ***Open in Project Browser*** *(Alt+P)* - Expands the Project Browser folders to show the selected pattern.
- ***Insert One*** *(Ctrl+Ins)* - Inserts blank pattern before the currently selected one.

- ***Clone Selected*** *(Shift+Ctrl+C)* - Inserts a clone of the current pattern right after it. The cloned pattern has the same note events (with their velocity, pan etc. properties) in the Step Sequencer as the original, but currently the events are not copied into the new pattern.

- ***Delete Selected*** *(Ctrl+Del)* - Deletes the current pattern.

- ***Move Selected Up*** *(Alt+Up)* - Moves all selected patterns one step up.

- ***Move Selected Down*** *(Alt+Down)* - Moves all selected patterns one step down.

- ***Flatten Selected*** - Scans the bars of the selected pattern row and reconstructs the whole sequence in one long Piano Roll sequence(s) inside the pattern. The separate bars are replaced by one large single bar containing the entire sequence. With this feature you can quickly convert repeated patterns in a large sequence and vary the separate repetitions without creating a separate pattern for each variation.

- ***Merge Selected*** - Flattens all selected pattern tracks and merges them all in the topmost selected pattern.

3. Audio Clips

- ***Auto Zero Crossing*** - Allows FL Studio to look for the closest zero (middle) level intersection when splitting an audio clip to bars, beats, or when using the Cut tool ( ). Splitting at zero intersection strongly reduces the chance of clicks and pops artifacts caused due to the abruptly start of an audio segment.

- ***Flat Mode*** *(Alt+F)* - Switches between flat and 3D rendering mode for the audio tracks.

- ***Glass Mode*** *(Ctrl+Alt+F)* - Turns on/off the glass shading effects for the audio tracks waveform preview.

4. View

Contains one command, Grid Color, which opens a dialog box for choosing a color for the Playlist grid.

5. Zoom

Contains a submenu with a set of quick zooming levels: Far (⌨ 1); Medium (⌨ 2); Close (⌨ 3); Best Fit (⌨ 4); On Selection (⌨ 5).

'On Selection' zooms the selected area of the time line to fit the screen (the command will be disabled if no time region is selected in the timeline).

6. Live Mode

Turns on/off the live mode feature of the Playlist. In live mode, you will see an on/off switch next to the name of each pattern track (8), that enables you to quickly turn a pattern playing on and off without drawing a fixed sequence with bars. As the name suggests, this feature is useful primarily for live performances and for testing various Playlist arrangements on the fly.

You can control the on/off switches using the keys on your MIDI keyboard as well (see MIDI Settings).

7. Center Grid (⌨ Backspace)

Scrolls the Playlis grid so the playing position marker appears in the middle. Useful when you want to see the playing position in a long sequence.

Audio and Automation Clips

The Playlist window contains a sequence of patterns and audio/automation tracks that form the complete song structure.

The bottom section of the Playlist contains the audio/automation tracks (9), page 231. The tracks provide an easy means of placing, arranging and editing a set of audio clips and parameter automation splines, with an intuitive preview of the data held in the clips (waveforms/automation splines). It is also possible to cut and split clips into multiple pieces, and arrange the pieces independently on the audio tracks. Some points to note:-

- Each clip available in the tracks view is an instance of an Audio or Automation Clip.generator (held in the Channels window). **Use the drop-down channel filter to select either Audio or Automation (see page 36)**
- Audio clip channels are a special version of the Sampler channels.
- Automation clips are a dedicated internal controller plugin. **Automation clips can be triggered by note events** (pitch information is ignored).

- Each clip channel you add in the Step Sequencer becomes available in the tracks view and vice versa. Dropping samples on the audio tracks generates an Audio Clip channel (unless a channel exists with the same sample).

Common Operations on Clips

Basic Operations

To place a clip, switch to draw ( ) or paint () mode and left-click in a track (if no clip was edited previously, you will see a dialog where you can browse for a sample to be used). Paint mode allows you to draw multiple instances of the clip at once (hold the mouse button and drag).

To erase an audio clip, click it with your right mouse button or use the left mouse button in erase ( ) mode.

To switch an audio clip instance to play another Audio Clip channel, open the clip menu (left-click the arrow in the top left corner of the clip) and from the Select Channel menu, pick an Audio Clip channel to switch to.

To open the Channel Settings of the channel associated with the audio clip instance, open the clip menu and select Channel Settings.

From the clip menu, select Preview to listen to the audio clip sample (hit the Stop button in the Transport panel to stop the preview).

Fast Creation of Automation Clips

When creating automation clips, it is faster and more natural to right-click an automatable control and select **Create Automation Clip**. This will automatically create and link the clip to the control as needed, and if you click inside the clip tracks an instance of that clip will also be created automatically.

FL Studio also provides a quick way to automate the volume/pan of an audio clip. Open the clip menu and select either Automate > Panning or Automate > Volume. Keep in mind that this creates an automation clip linked to the volume/panning placed over the audio clip, i.e. it overlays the audio clip and doesn't show the envelope curve inside the audio clip itself. You can use the focus switches (see section 7 above) to bring either clip to the front for editing. More information about working with focus groups and overlaid clips is provided below.

Make Unique

By default, all instances of either an audio or automation clip you place share the same channel. This means they share the same LFO/envelope and sample selected. Sometimes you'll want to place an instance of a clip and edit it independently without affecting the other instances. To do this, open the clip options menu (the triangle icon on top left of the clip) and select Make Unique. The clip channel will be cloned, and the clone will be assigned as a 'unique' instance.

Focus and Editing Options

The two buttons in section 7 allow you to select the focus of editing in the audio/automation tracks. You can select to bring either audio (left button) or automation clips (right button) to be displayed in front when there are overlapped clips. This allows you to overlap an audio clip with its matching volume or pan automation clips, and selectively bring either in front as you work. CTRL+click both clips so they are selected and can be moved together.

The options below are context-sensitive depending on the selected focus:

- ***Audio focus:*** **Zero-Cross** - Enable to allow 'snap' slicing and resize operation of audio clips to the nearest zero-crossing around the desired location. This means that sliced audio clips won't create 'click' and 'pop' sounds at the slice locations.

- ***Automation focus:*** **Step** - Enable to set the automation clip spline editor in step editing mode . Drag in the clip to create a 'free hand' curve where a new control point is defined for every step in the timeline (steps depend on the current snap settings). Hold SHIFT key while dragging to draw 'pulse' lines (straight vertical/horizontal lines only). Note that each new segment created this way uses the last tension set while adding a segment.

- ***Automation focus:*** **Slide** - Enable to preserve the relative distance between a dragged control point and all control points following it (enabled by default).

Splitting and Regions

A powerful feature of both automation and audio clips is the ability to split them in pieces and arrange the pieces independently on the tracks. Here are the methods you can use to split a clip in multiple pieces:

1. **Using the Cut tool** ( ) - Select the Cut tool. Go to a clip, press and hold the left mouse button. Now drag to define the 'cut line' slope and length, then release the button. All audio clips that intersect with the line are split at the intersection point.

2. **Split on each beat / bar** - You can split your audio clips on even pieces for each bar or beat in the timeline. Open the clip menu and from the Chop into menu select Bar or Beat to split in bars or beats, respectively. Beat (Random) splits the audio clip in beats and reorders the resulting pieces in a random order.

3. **Autodetect** - FL Studio can split your audio clip using its integrated BeatSlicer engine. To auto-split an audio clip, open its menu and from the Chop into menu select Autodetect.

4. **Precise split using external cue points** - FL Studio reads the cue points embedded in all samples used as audio clips. Cue points can be inserted in most of the popular wave editors, such as Adobe Audition (previously known as Cool Edit®) and SoundForge®. Cue points allow you to create perfectly accurate regions inside the waveform. You also can take advantage of 3rd party tools which create those regions automatically based on a special analysis of the sample (e.g.

BeatSlicer, which marks the start of each detected beat with a cue point) and then split the audio clip in FL Studio.

To split an audio clip into regions, open the clip menu and from the Chop into menu select Regions (if the wave doesn't contain regions, this command is disabled).

You can also directly set an audio clip to show only a specific region contained in the sample. To do so, open the clip menu, and from the Select Region menu select a region name, or select Full Sample to show again the full audio sample (only Full Sample is available for clips without regions).

Automation Clips: Envelopes and LFO Unit

Each automation clip comes with a main envelope (bottom - 0%, top 100% output value), LFO unit and a spline envelope (-100% - 100%) to articulate the LFO output level.

Editing of envelopes is consistent with that of other FL Studio envelopes and plugins, and offers a powerful selection of spline segment types and editing modes.

When you create an automation clip, the default settings will show the main envelope and the LFO unit as disabled.

To enable the LFO and see/edit the LFO level articulator envelope, open the clip Channel Settings and enable 'LFO'. When the LFO unit is enabled, the main envelope is still active and combined with the LFO output value either by multiplication or addition (offset). This can be set in the channel settings window.

The envelopes of automation clips are highly customizable and each envelope can be comprised of unlimited type and tension settings (acceleration).

Curve Editing

Here are several basic operations you can perform to edit the envelope:

Add a new Control Point - Position your cursor over the line until the add point cursor appears (). Right-click and a new point will be added.

Reposition a Control Point - Drag the control points with your left mouse button. Hold SHIFT while dragging to lock vertical position or CTRL to lock horizontal position.

Delete a Control Point - Right-click a control point and select Delete. Alternatively, hold ALT and left-click.

Change Segment Type - FL Studio offers three types of spline segments to select from. Right-click a control point and you will see three spline type options (the affected segment is the one preceding the control point): Single Curve - the default mode which allows you to create linear, ease in and ease out curves (depending on the tension); Double Curve - allows linear, ease in-out and ease out-

in curves (depending on the tension); Hold - creates 'hold' or 'pulse' curves which are handy for creating abruptly value changes in your envelope.

Change Segment Type Tension (Acceleration) - Drag the tension handle of each spline up/down to change the spline appearance. Right-click the handle to reset to a straight line. Hold CTRL during adjustment to fine tune.

Patterns

The Playlist window contains a sequence of patterns and audio tracks that form the complete song structure. The Playlist contains two work areas. **The top section** contains the pattern tracks (6), each track representing one pattern. The names of the patterns are displayed on the left side of the Playlist (right click a name to change it).

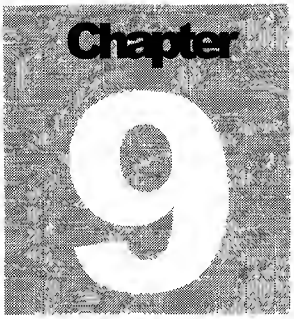
You can set multiple patterns running at the same time, but note that you should not combine patterns that both contain a sequence for a monophonic instrument (such as the TS404 bassline). Since monophonic instruments play one note at a time, only one of the patterns will play, or both patterns may play, but incorrectly. To trigger a pattern at a specific time, left-click its track while in draw ( ) or paint ( ) mode to create a bar. Paint mode allows you to draw several bars at once while dragging horizontally in the Playlist .

In the same way that you work with notes in the Piano Roll, once created, you can drag the pattern bars to adjust their start time. Unlike the Piano Roll, however, you cannot adjust the bar length in the Playlist. The bar length is fixed and reflects the length of the individual patterns, determined by the pattern contents: sequence grid length, notes and automation events.

You can draw overlapping bars in the Playlist, but note that only one instance of each pattern can play at a given moment (i.e. each new bar 'cuts' the playback of the previous bar for the same pattern).

To erase a bar, click it with your right mouse button or use the left mouse button in erase ( ) mode.

The second, or **bottom section** of the Playlist window contains the work area for audio clips and automation clips , as described on page 235.



'My friend has a baby. I'm recording all the noises he makes so later I can ask him what he meant.'
Steven Wright.

Recording and Automation

In FL Studio you can record three different types of data - **notes** (MIDI/USB keyboard performances), **audio** (internal mixer audio or external audio from a microphone/audio-input), and continuous **controller changes** (volume, pan, cutoff filter tweaks, etc). This chapter considers these functions and recording techniques in detail.

Live Recording

Live recording describes the process of capturing some aspect of a live performance such as a keyboards or vocals. To start a recording session, turn the **Record button in the Transport panel on** by clicking on it. The color will change to orange to show that it is 'armed', ready to record. Next, press the **Play button** (also located in the Transport panel). FL Studio will play the current project and capture MIDI/USB events from your keyboard. You can select whether you want the melody recorded in the Piano Roll score of the channel or in the Step Sequencer (see the MIDI settings section).

Canceling a Recording Session

You can cancel a recording session so that recorded notes and automation events are not saved. Choose Cancel Current Recording command from Help menu, but note that you should do this while recording, BEFORE pressing the Stop button. If you press it, you can still undo the whole recording session by choosing Undo from the Edit Menu. If you had recorded mixer tracks during the last session, you will be prompted if you agree that the files are erased (i.e. undone). Be careful, because once you undo audio recording, the files cannot be restored and you will have to record them again if needed.

Recording Controller Data

FL Studio can capture the value changes over time of any control that can be automated (e.g. turning up the volume fader of a mixer channel). In recording mode, FL Studio captures all changes made to automatable parameters (knobs, sliders, LCDs, switches). These controls can be manipulated using the mouse or an external MIDI/USB controller. Next time the song is played the controller movements are reproduced exactly the way they were recorded.

There are two places FL Studio can store automation data. The first is to associate the automation data with specific pattern blocks (**automation events**). This data is able to be recorded live and edited using the **Event Editor** (page 250). As they are associated with patterns, automation events are placed in the upper Playlist window. The second place FL Studio can store automation data is within **Automation clips**, which can be drawn manually, but do not accept live recorded automation data. Automation clips are placed in the lower Playlist window. They are discussed in more detail on **page 83**.

Some **internal controller plugins** (effects or generators) can also move controls for you automatically. These plugins can, for example, follow the special features of a sound (like volume envelope in the Fruity Peak Controller) and map them to the value of a control of your choice, or provide automatic LFO for controls where otherwise that would be impossible.

To determine if a control can be recorded or linked to an external MIDI controller, position the cursor over it and check what is **displayed in the hint bar** of the Main panel (page 17). Look for these icons:

- Shows the control is automatable (events can be recorded and then edited with an Event Editor)

- Shows the control can be controlled remotely by a MIDI controller.

There are five ways to add 'live tweaks' to your project:

- ***Live Recording*** - Recording control changes during a live recording session.
- ***Event Editor*** - Editing, refining and drawing control value changes in a graph.
- ***Automation Clips*** - Automate your controls easily and naturally with the spline-based automation clips.
- ***Live Recording Using MIDI Controller*** - Using your MIDI controller during a live recording session.
- ***Internal Controller Plugins*** - Using plugins to automate control values parametrically.

Audio Recording/Mixer Channel Recording

FL Studio allows you to record live audio from an external sound source OR record mixer audio tracks. Both can be accessed through the mixer input selector (below, and page 189). Recording mixer tracks is a great way to free up your CPU when capacity gets tight.

Prerequisites for Recording External Audio

Please note that in order to record external audio you will need:

1. FL Studio Producer edition or higher.
2. An ASIO driver for your soundcard.
3. FL Studio in ASIO mode.
4. The sound source connected to your PC via your soundcard or a USB/Firewire interface.

If you activate menu N (below) and there are no input options, then at least one of the conditions above is not met. It is possible that your soundcard does not support the **ASIO** standard. In this instance you can try the **www.asio4all.com** driver on your system. Please note that this suggestion is a 3rd party work-around and Image-Line is not liable for any problems caused by the use of this driver.

Recording External Audio

To prepare FL Studio to record external audio, one or more **mixer tracks must be 'armed'** (shown by an orange icon at P below). The recorded audio files are saved to the hard disk and can be inserted optionally as **Audio clips** in the **Playlist,** or into **Sampler channels**. If the **mixer input selector** (N) is not showing an external audio source (one of the inputs of your soundcard for example) and is 'none', FL Studio will record any 'internal' audio on that mixer channel.

Streaming and I/O (routing) settings

NOTE: ASIO (Audio Stream Input/Output) is a driver program that allows the soundcard to communicate with the host computer with high efficiency, that is, the audio stream is processed with much lower delays than with standard audio drivers. Without this fast access, audio recording in time with FL projects is impossible. There is a 3rd party work-around at **www.asio4all.com** that may help if your soundcard does not support ASIO. **Please be aware that you use this ASIO driver at your own risk.**

Steps outlining the external audio recording procedure are described on the next page.

External Audio Recording Procedure:

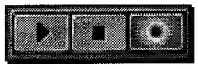
1. **Mixer channel arming**: Select an external input (N). This should auto-arm the channel for recording and the disk icon (P) will turn orange.

2. **Mono to Stereo (optional)**: If you have a mono sound source that appears in only the L or R stereo channel you can turn the stereo separation knob on the mixer (page 187) all the way to create a stereo signal for recording.

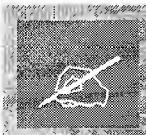
3. **Optional naming**: Select the name and location of the saved WAV file other than the default. Press the disk icon (P) TWICE, the first time will de-select the arming, the second time will re-select it an bring up the file-name/location dialogue. Select a location in the browse dialog and name the .WAV file to be recorded. If you use right-click, an automatic file name is assigned to the track. Do the same for all mixer tracks you want to record.

4. **Recording Options**: Open the Mixer pop-up menu (1). In the Disk Recording submenu check 32bit floating point recording if you want to render to 32bit wave files. Open the Mixer pop-up menu (1) and the Disk Recording submenu and select Auto-create audio tracks to automatically insert recorded audio clips in the Playlist.

5. **Rendering**: In the Transport panel, ensure Record Mode is activated (orange) and push the Play button to start recording.



6. **Stop recording**: When you are finished, press the Stop button. At this point, all armed tracks will become unarmed, depending on whether you have enabled the Disk Recording > Auto-Unarm option in the Mixer pop-up menu.



NOTE: If you are in **Pattern mode** (page **Error! Bookmark not defined.**) the audio will appear as a new audio-clip in the channel window. If you are in **Song Mode** and the '**Auto Create Audio Clip**' option is on, page 191) the audio will be automatically placed in the Playlist window.

Recording Mixer Audio

FL Studio allows you to record the output of one or more mixer tracks to .WAV files and auto-insert the resulting audio clips back in the project as audio tracks (see note above).

Track recording enables you to quickly replace the real-time effects and instruments rendering for a track with low CPU usage audio. It also helps for easier rendering of separate mixer tracks for additional processing in 3rd party applications. For users with ASIO enabled sound cards, you can

route ASIO inputs (see Audio Input/Output Routing above) to the track input (e.g. microphone, line in) and record it in the resulting .WAV file.

There are two ways to record a track: real-time (interactive), allowing recording of ASIO inputs; and non-realtime, allowing (usually) faster rendering times and higher audio quality.

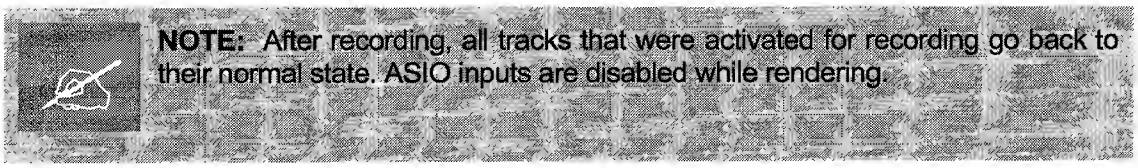
Real-time Mixer Channel Recording

Follow steps 2 to 5 as for external audio recording above. However, do not select an external audio input at (N). The audio that appears on that mixer channel will be recoded until you press stop.

Non-real-time Recording (rendering)

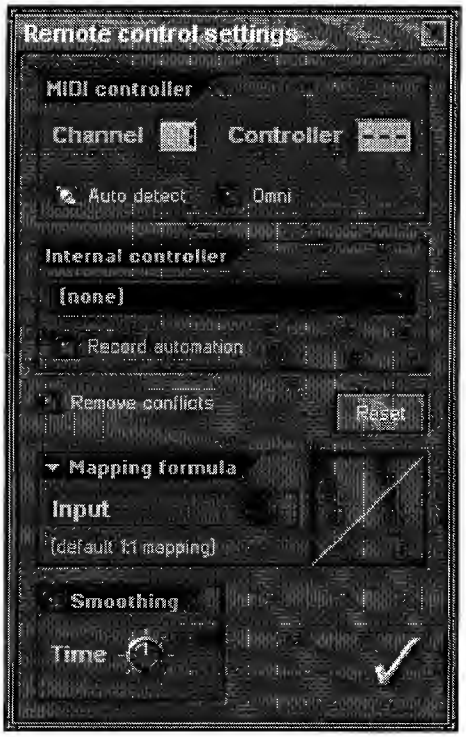
To export a track:

1. **Prepare the tracks**: Press the disk icon (P) on the routing panel. In the browse dialog that will open, select a location and name for the .WAV file to be recorded. The disk icon turns orange to show the track is ready to be recorded. Do the same for all mixer tracks you want to record.
2. **Recording Options**: Open the Mixer pop-up menu (1). In the Disk Recording submenu check 32bit floating point recording if you want to render to 32-bit wave files. Open the Mixer pop-up menu (1) and the Disk Recording submenu, select Auto-create audio tracks to automatically insert the recorded audio clip in the Playlist.
3. **Rendering** (Alt+R): Open the Mixer pop-up menu (1) and the Disk Recording submenu, select Render to Wave File. The rendering settings dialog appears. Adjust the settings and press OK to render the track. NOTE: Some of the options available when rendering a full song are not available for track recording: render to MP3 or MIDI file, saving of NFO file with the audio clip, and saving ACID-ized audio.


NOTE: After recording, all tracks that were activated for recording go back to their normal state. ASIO inputs are disabled while rendering.

Live Recording Using MIDI Controller

During a recording session, you have to move the knobs and sliders in the FL Studio interface to automate their movement. However, if you own an external MIDI controller, you can use it to control all these settings. If the device you use can also send note events (usually these are MIDI keyboards), you can also use it to record melodies in FL Studio (see MIDI Settings for various options concerning keyboard input). To use your MIDI controller/keyboard in FL Studio, first ensure you have selected the correct driver in the Remote Control Input combo box, located in the MIDI Settings page. Then check if the Enable MIDI Remote control option is enabled in the Options menu.



Linking control to MIDI/USB device

Right-click a control to be linked and from the menu that appears click Link to Controller. The Remote Control Settings dialog appears. To link a knob in a 3rd party plugin see page 74.

MIDI Controller

- ***Channel*** - Choose a channel to link the control to.
- ***Controller*** - Choose a controller to link the control to.
- ***Auto Detect*** - Very useful option that will detect and set the MIDI controller automatically - all you need to do is **move the desired control on your MIDI controller.**
- ***Omni*** - If unselected, FL Studio will link only the current control to this MIDI controller. Otherwise, all controls of the same type are linked automatically. For example, if this option is turned off and you link a volume knob, the volume knobs in all channels are linked to the same controller, and the MIDI input gets the currently selected channel.

In addition to the standard MIDI controllers, FL Studio supports several types of custom MIDI controllers (endless knobs, switches etc.). For more information, see MIDI Settings.

Internal Controller

This section allows you to link the property to an internal controller plugin. It appears only if you have added at least one controller plugin. For more information see Internal Controllers Plugins.

Remove Conflicts

When this option is checked, FL Studio will remove conflicts, like linking two knobs to the same controller (either MIDI or internal).

Reset

Click this button to reset the remote control settings, including mapping formula and smoothing.

Mapping Formula

Here you can enter a formula that is used to map the controller values to the property you link. The default formula is 'Input', Input is the variable that holds the value of the controller (1:1 mapping). Now you can enter an expression to alter the default 1:1 mapping. For example: 'Input*2' multiplies the controller value by 2. When you write an expression, press Enter. If you see the message 'Compiled OK', the formula was successfully compiled and you can press the OK button to apply it to the linked control. If red text appears below, the formula is wrong (usually syntax error or unsupported variable/function were used). Correct the error and press Enter again.

Smoothing

This feature allows you to smooth the motion produced by the remote control hardware and/or internal plugin. This reduces the need to manually refine recorded automation after live sessions and ensures proper ramping of the control motion to avoid abrupt changes.

- ***Time*** - The amount of smoothing applied to the remote control input. The longer the time, the smoother the motion.

Linking effects

If you want to automate an FL Studio effect, you can controls it exactly as you would any FL Studio control - right-click it to launch a pop-up menu, from where you can display the Remote Control Settings dialog box. The same goes for VST effects that do not have their own editor interface. FL Studio provides interface for the plugin, and all knobs can be automated as usual.

To link VST effects that have their own interface, go to the FX popup menu (see Mixer window) and select Link to MIDI controller item. From the submenu that appears, select All to link all effect controls at once (e.g. if you select controller 8, the first control is mapped to controller 8, the next one to controller 9 etc.), or alternatively, select a property name to link it alone. Be warned that many 3rd party VST effects do not report their settings properly and might crash when you try to link them to a MIDI controller. It is strongly recommended that you save your project before mapping VST settings for remote control.

Unfortunately, there is no way to link DirectX effects to a MIDI controller. This limitation is due to DirectX specifications, rather than because of FL Studio per se. Some DirectX plugins have MIDI remote controller functionality, but NOT through the DirectX interface (so they cannot be linked inside FL Studio). To link such effects, follow the help instructions that come with your DirectX plugin.

Internal Controller Plugins

You can use internal controller plugins (effects or generators) to move the controls for you automatically. These plugins can, for example, follow special features of a sound (like volume envelope, as in the Fruity Peak Controller) and map them to the value of a control of your choice, or provide automatic LFO for controls that would otherwise be impossible.

Linking a Control to an Internal Controller

The controller plugins provide special internal controllers in FL Studio, that are used to link a control to the plugin. To link a control to such internal controller, right-click it and from the menu that appears click Link to MIDI Controller. The MIDI Remote Control dialog appears.

MIDI Controller

This section allows you to link a control to a MIDI controller. For more information see Live Recording Using MIDI Controller.

Internal Controller

Here you can link the property to an internal controller that controller plugins provide. Note that this section is NOT VISIBLE when there aren't any controller plugins added in the current FL Studio project.

- ***Record Automation*** - This switch should be usually turned off. When turned on, all events generated by the controller plugin will be recorded during a live recording session, as if you moved the control manually. However, you may turn this switch on if you want to use the controller plugin as a tool (like you use the LFO tool) to record specific set of events that you can then further refine and edit in the Event Editor window. It also makes possible to record events from controller plugins that might use much CPU when used in real-time. Don't forget to unlink the control after you recorded the events you need. Not doing so may result in conflict between the recorded events and those generated in same time by the plugin.

Remove Conflicts

When this option is checked, FL Studio will automatically un-link the previously linked controllers to the knob. If you would like to link two knobs to the same controller (either MIDI or internal) make sure this is off.

Reset

Click this button to reset the remote control settings, including mapping formula and smoothing.

Smoothing

This feature allows you to smooth the motion produced by the remote control hardware and/or internal plugin. This reduces the need to manually refine recorded automation after live sessions and ensures proper ramping of the control motion to avoid abrupt changes.

- ***Time*** - Amount of smoothing applied to the remote control input. The longer the time, the smoother the motion.

Mapping Formula

You can enter formulas that drive controller values (click the title for a list of formula presets). A common desire is to have the controlled knob decrease as the controller increases. The default formula is 'Input', a variable that holds the value of the controller (1:1 mapping). Now you can enter an expression to alter the default 1:1 mapping. For example: 'Input*2' multiplies the controller value by 2. When you write an expression, press Enter. If you see message 'Compiled OK' the formula was successfully compiled and you can press the OK button to apply it to the linked control. If red text appears below it, the formula is wrong (usually syntax error or unsupported variable/function). Correct the error and press Enter again. For a full list of supported variables see page 211.

Linking effects

If you want to automate an FL Studio effect, you can control it exactly as you would any FL Studio control - right-click it to launch a pop-up menu, from where you can display the MIDI Remote Control dialog box. The same goes for VST effects that do not have their own editor interface. FL Studio provides interface for the plugin, and all knobs can be automated as usual.

To link VST effects that have their own interface, go to the FX pop-up menu (see Mixer window) and select Link to MIDI controller item. From the submenu that appears, select All to link all effect controls at once (e.g. if you select controller 8, the first control is mapped to controller 8, the next one to controller 9, etc.), or alternatively, select a property name to link it alone. Be warned that many 3rd party VST effects do not report their settings properly, and might crash when you try to link them to a MIDI controller. It is highly recommended that you save your project before mapping VST settings for remote control.

Unfortunately, there is no way to link DirectX effects to a MIDI controller, due to limitations in DirectX specifications, rather than in FL Studio itself. Some DirectX plugins might have MIDI remote controller functionality, but NOT through the DirectX interface (so they can not be linked right inside FL Studio). To link such effects, follow the help instructions provided wiith your DirectX plugin.

Included Internal Controller Plugins

FL Studio comes with several internal controller plugins available as effect or generator plugins. These are:

- *Dashboard*
- *Automation clip.*
- *Fruity Formula Controller*
- *Fruity Keyboard Controller*
- *Fruity Peak Controller*
- *Fruity X-Y Controller*

Step Editing

Step editing is a technique for recording melodies note by note using your MIDI keyboard (or computer keyboard if Typing Keyboard to Piano is enabled).

To start the step editing mode, first enable it from the Recording panel or the Options menu. In the Step Sequencer, select the channel you want to step edit.

Now each time you press a key on the MIDI keyboard a new note is added in the Piano Roll (you don't need the Piano Roll window opened to step edit) and the position advances to the next step automatically. The step size is equal to the snap size in the Recording panel.

You can use the Num. pad / key on your keyboard to go back to the previous step position. Adding note in an already filled position erases the old step.

The Num. pad * shortcut sends the marker to the next step position. This way you can leave empty spaces between the steps.

You can also create steps longer than the current snap setting. While holding a MIDI key on your keyboard, press the advance position shortcut (Num. pad *) one or more times then release the MIDI key.

Supported MIDI devices

Don't worry if you have a device that isn't on the supported list. It just means that FL is configured specifically to work with that device.

General MIDI controllers supported

FL Studio supports all generic MIDI controllers that use absolute value knobs and sliders.

Custom MIDI controllers supported

FL Studio supports several types of custom MIDI controllers. Features supported include endless (relative) knobs, switch controls, support for jog and transport controls. To enable the advanced features of your custom MIDI controller, you need to select it in the Control Surface list in the MIDI settings window. If the device is not listed, it is not supported.

Currently the supported devices in this category include

- *Peavey StudioMix*
- *Tascam US-428*
- *Editor PCR-30/50*
- *Hercules DJ Console*
- *Korg MS-20 Controller*
- *Korg microKONTROL*

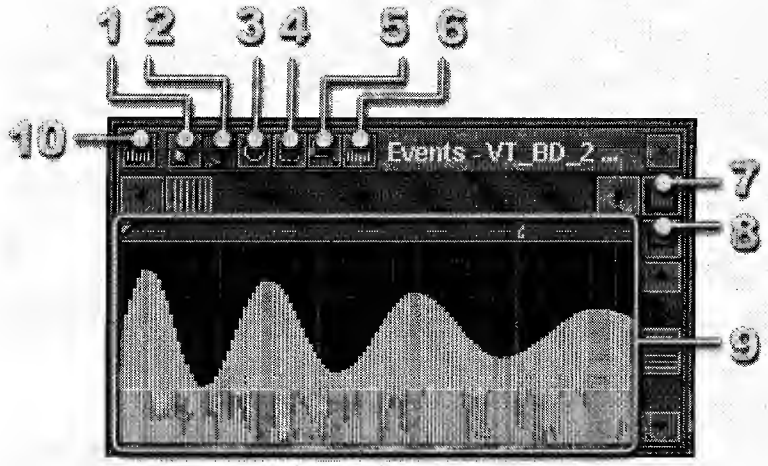
Other similar devices may also function properly.

Keyboards

FL Studio supports all MIDI/USB keyboards, keyboard synthesizers with MIDI/USB output, and all other similar devices with General MIDI output. To play a synth in FL Studio using an external keyboard, select its channel in the Step Sequencer.

Event Editor

The Event Editor allows you to view, edit and save/load recorded automation data associated with pattern blocks. You may also use it to write direct events without making a recording session. If you would like to have automation data that is not associated with a pattern block, use Automation clips (page 83).



1. Draw Mode (P)
2. Brush Mode (B)
3. Erase Mode (D)
4. Select Mode (E)
5. Zoom To Selection (E)
6. Interpolate Mode (I)
7. Zoom (PgUp/PgDown)
8. Vertical Zoom
9. Event Graph Area
10. Event Editor Menu Button

The Event Editor looks like a graph, where the horizontal axis represents time, and the vertical axis represents event values. Events are displayed as vertical lines (height represents the value of the event). Each Event Editor window can display only one type of events at a time (e.g. cutoff changes). To open an Event Editor, right-click any automatable control in and from the menu that appears, select Edit Events item to switch displayed events in the currently opened Event Editor (or to open a new one if there isn't any). You can also select Edit Events in New Window instead, to open a new Event Editor window.

To create an event in the Event Editor switch to Draw Mode (1) or Paint Mode (2) and left-click in Event Graph Area (9). You can also create whole curves of events - just left-click and drag to create the desired shape. To create straight lines of events instead, right-click in the grid and drag. Draw Mode and Paint Mode are identical, however Paint Mode will ignore the current snap settings. This allows you to draw smooth curves without changing your snapping preferences.

To create interpolation between events, use the Interpolate Mode (6). While in this mode, left-click and drag to select the events to be interpolated. The events you select will be marked in blue. When you release the mouse button, all selected events will be refined using linear interpolation. To use spline interpolation, start dragging with your right mouse button instead.

To erase events, use the Erase Mode (3). While in this mode, left-click and drag to select events to be removed. Selected events will be marked in red and are deleted with the release of the button.

To select events in any mode (drawing, erase, interpolate), double-click or Ctrl+click the time ruler and drag to select a time range. You can also use the special Select Mode (4), to select with a single left-click and drag. Selections are used when cutting events and using the LFO tool (see the menu commands described below).

Using the Event Editor with Effects

If you want to open an Event Editor for an FL Studio effect plugin, right-click on the plugin name in the effects list to launch the popup window, then right-click any knob you wish to automate and select Edit Events from the popup menu. The same procedure can be used for VST effects that do not have their own editor interface. Since FL Studio provides an editor for the plugin, all controls behave as usual (right-click a control and select either Edit Events or Edit Events in New Window).

To open an Event Editor for a property in VST effects that has its own interface, open the FX popup menu (see Mixer window) and select Open Event Editor item. From the submenu that appears, select a property name to open an Event Editor for. Be warned that many 3rd party VST effects do not report properly their settings, and might crash when trying to open an Event Editor. It is highly recommended that you save your project before trying to use Event Editor for such effects.

Unfortunately, there is no way to open Event Editor for DirectX effects, due to limitations within DirectX specifications, rather than from FL Studio.

Event Editor Menu

This menu provides useful commands for editing events. You can access the Event Editor menu by clicking the Event Editor menu button (10).

1. File

- ***Open Automation*** - Imports automation data from a score file (.FSC) in the current Event Editor.
- ***Save Automation as*** - Saves the automation data from the current Event Editor to a score file (.FSC).
- ***Import MIDI*** *(Ctrl+M)* - Shows the Import MIDI Data dialog box that lets you import controller data (cutoff, resonance etc.) from MIDI file to the Event Editor.
- ***Paste from MIDI clipboard*** *(Shift+Ctrl+V)* - Works exactly as the previous command, but uses MIDI clipboard data rather than a MIDI file. You can paste data from many sequencers that can copy to MIDI clipboard format (e.g. Cakewalk Pro Audio™).

2. Edit

- ***Cut*** *(Ctrl+X)* - Cuts all selected events to the clipboard. Select an area to cut, or this command will be disabled.
- ***Copy*** *(Ctrl+C)* - Copies all selected events to the clipboard. Select an area to copy, or this command will be disabled.
- ***Paste*** *(Ctrl+V)* - Pastes events from the clipboard to the current Event Editor. If you don't select an area to be pasted in, the events will be pasted in the beginning of the pattern.
- ***Delete*** *(Del)* - Deletes all selected events in the Event Editor. Select an area to delete, or this command will be disabled.
- ***Delete All*** *(Ctrl+Del)* - Deletes all events in the current Event Editor.
- **Select All** (Ctrl+A) - Selects all events in the Event Editor.
- ***Select Previous*** *(Ctrl+Left)* - Moves the selection backwards so the selection start matches the new selection end. For example, if you select a bar, this command selects the previous bar.
- ***Select Next*** *(Ctrl+Right)* - Moves the selection forward so the selection end matches the new selection start. For example, if you select a bar, this command selects the next bar.
- ***Insert Space*** *(Ctrl+Ins)* - Creates 'empty' space that matches the current selection start and length by shifting the following events forward.
- ***Delete Space*** *(Ctrl+Del)* - Erases all events in the current selection and shifts back the following events to close the gap.
- ***Insert Current Controller Value*** *(Ctrl+I)* - Initializes the Event Editor with the current value of the corresponding automated control. If you have selected a time slice in the graph, the current value will be inserted at the beginning of the selection instead.

3. Tools

- ***LFO*** *(Ctrl+L)* - Shows the LFO dialog that lets you draw LFO shapes in the Event Editor.

4. View

- ***Grid Color*** - Opens a standard Windows Color dialog box, where you can set a color for the Event Editor grid.

5. Zoom

Contains a submenu with a set of quick zooming levels: Far (⌥⌘ 1); Medium (⌥⌘ 2); Close (⌥⌘ 3); Best Fit (⌥⌘ 4); On Selection (⌥⌘ 5);

On Selection zooms the timeline to fit the selection (the command will be disabled if no time region is selected in the timeline).

6. Relocate Events

When turned off, the Paste command will overwrite any existing events, and the Cut/Delete commands will leave 'holes' in the area selected to cut/delete.

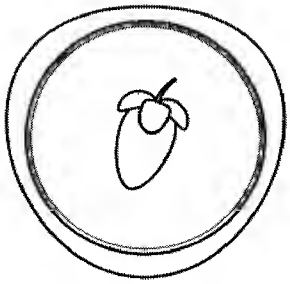
Turning this option on will instead insert the pasted events, and the Cut/Delete commands will shift back all events after the selected area to remove the 'hole'.

7. Auto Smoothing

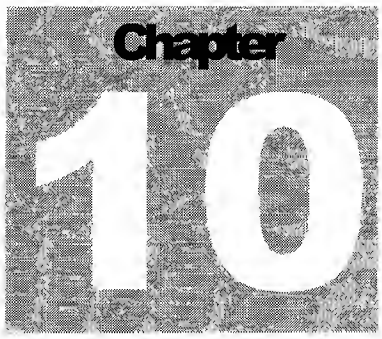
When checked, the drawn events are automatically interpolated (smoothed) upon mouse button release.

8. Center (⌥⌘ Backspace)

Scrolls the timeline so the playing position marker appears in the middle. Useful when you want to see the playing position in a long sequence.



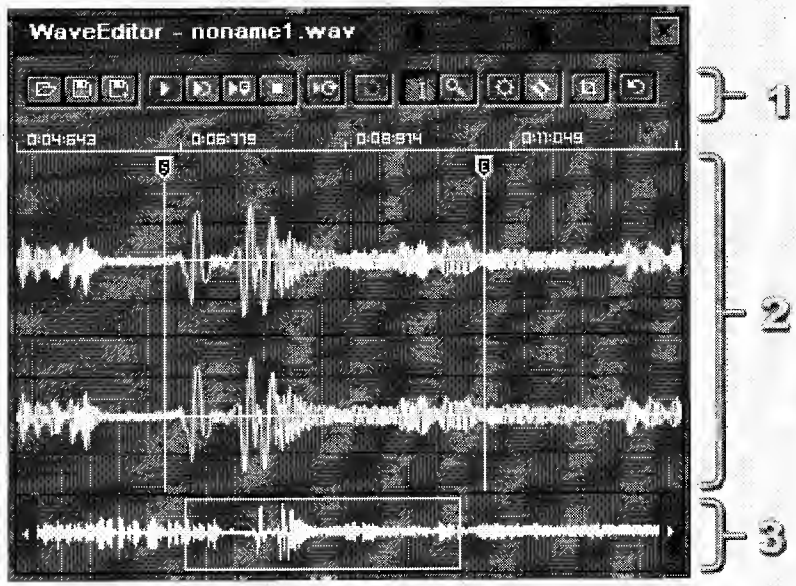
'Like as the waves make towards the pebbled shore, So do our minutes hasten to their end.'
William Shakespeare



The Wave Editor

FL Studio includes an integrated wave editor which allows you to edit samples quickly and effortlessly without having to use external applications. The editor allows you to do all basic operations over the samples, such as fade in/out, record normalize volume, etc. **You can edit any sample by opening its Channel Settings and pressing CTRL+E**, or by opening the Channel Settings menu and selecting the Edit command.

The following topics provide more information on the integrated wave editor:



1. Toolbar.

2. Wave display window.

3. Zoom/Preview window.

Basics

This section covers the basic interface of the integrated wave editor.

Toolbar

The toolbar contains a set of buttons performing various operations in the wave editor. See below.

Large View

This area displays the wave selection from the Full Preview. In selection mode, you can select part of the wave (to be processed), adjust the loop points (by dragging the handles marked with S and E). To select only left or right channel, move the cursor up or down until you see an L or R ext to your cursor. Now select as normal and only the left or right channel will be selected. If you right-click, you can see the wave editor's pop-up menu (for more information, see Pop-Up Menu).

In zoom mode, drag to select an area with your mouse and the view zooms to display your selection. Right-click to zoom out.

Full Preview

This area displays the entire wave and allows you to select which section is shown in the Large View. Drag the left and right edges of the white rectangle to set the visible area.

Main Toolbar

Commands available on the wave editor toolbar include:

Open - Opens a sample for editing.

Save - Saves the changes to the edited sample.

Save As - Allows you to save the current sample to a copy with a different name.

Play - Plays the sample

Play Selection - Plays only the part of the wave you have selected.

Play Loop - Plays the loop determined by the loop points of the wave (if any).

Stop - Stops Playback.

Loop Mode - Turns loop playback mode on/off.

Record - Records to a new wave (the name and location are determined by the player Recording Settings).

Selection Mode - Switches the editor to selection mode.

Zoom Mode - Switches the editor to zoom mode.

Process - Contains the following set of commands to process the wave (most commands require selection to operate properly):

- ***Fade In*** - Applies a fade in effect to the selection.
- ***Fade Out*** - Applies a fade out effects to the selection.

- ***Normalize*** - Increases the overall sample volume as much as possible before clipping occurs.
- ***Reverse*** - Reverses the direction of the selected part of the wave.
- ***Invert*** - Inverts the polarity of the selected part of the wave.
- ***Stereo <-> Mono*** - Toggles the wave between mono and stereo format. NOTE: When converting from stereo to mono, all stereo data will be lost and can not be restored by switching later back to stereo.
- ***Swap Channels*** - Swaps the left and right channels in a stereo sample.
- ***DC Removal*** - Centers the wave if it has DC offset.
- ***Crossfade Loop*** – Cross-fades the looped section of the sample (not selection!) to fix any clicks or pops at the loop points.

Edit- Contains the following set of commands to edit the wave (most commands require selection to operate properly):

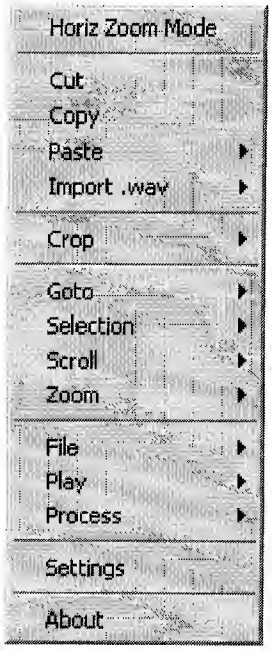
- ***Cut*** - Moves the selection to the clipboards
- ***Copy*** - Copies the selection to the clipboard.
- ***Paste Over*** - Replaces the selection with the clipboard contents (if the selection is shorter, only part of the clipboard contents are used).
- ***Paste Insert*** - Inserts the clipboard contents at the start of the current selection.
- ***Paste to Stereo*** - If you have a mono sample, this command converts the sample to stereo and insert the clipboard content in the right channel, while keeping the left channel intact.
- ***Import .WAV*** : To Clipboard - Imports the wave file you select to the clipboard.
- ***Import .WAV*** : To Selection - The wave file you select will replace the selection in the edited sample (if the selection is shorter, only part of the imported wave is used).
- ***Crop: Loop*** - Crops the wave so only the loop section remains.
- ***Crop: Selection*** - Crops the wave so only the selection remains.
- ***Crop: End Loop Marker*** - Crops the content after the loop end marker.
- ***Select All*** - Selects the entire sample.
- ***Select Loop*** - Selects the loop section of the loop.

Settings - Opens the wave editor's Settings window.

Undo - Restores the wave to the content before the last edit you have performed.

Pop-Up Menu

The following commands are available on the wave editor (right-click) menu:



- ***Toggle Edit/HZoom*** - Switches to zoom mode.
- ***Cut*** - Moves the selection to the clipboards
- ***Copy*** - Copies the selection to the clipboard.
- ***Paste - Paste Over*** - Replaces the selection with the clipboard contents (if the selection is shorter, only part of the clipboard contents are used).
- ***Paste Insert*** - Inserts the clipboard contents at the start of the current selection.
- **Loop Start** - Scrolls the view (if necessary) to the loop start position.
- **Loop End** - Scrolls the view (if necessary) to the loop start position.
- **Selection Start** - Scrolls the view (if necessary) to the loop start position.
- **Selection Start** - Scrolls the view (if necessary) to the loop start position.

Selection

- ***Select All*** - Selects the entire wave.
- ***Select Loop*** - Selects the loop area.
- ***Selection = Left*** - Selects only the left channel.
- ***Selection = Right*** - Selects only the right channel.
- ***Selection = Both*** - Selects both channels.

Scroll

- ***Scroll Left*** - Scrolls the view to the left.
- ***Scroll Right*** - Scrolls the view to the right.

Zoom

- ***Selection*** - Zooms to the current selection.
- ***In Vertically*** - Zooms in vertically.
- ***Out Vertically*** - Zooms out vertically.
- ***In Horizontal Maximum*** - Zooms in vertically to the maximum zoom level allowed.
- ***Out Horizontal Overview*** – Zooms out vertically to show the entire span of the wave.
- ***In Vertically*** - Zooms in vertically.
- ***Out Vertically*** - Zooms out vertically.
- ***In Horizontal Maximum*** - Zooms in vertically to the maximum zoom level allowed.
- ***Out Horizontal Overview*** - Zooms out vertically to show the entire span of the wave.

File

- ***Open*** - Opens a sample for editing.
- ***Save*** - Saves the changes to the edited sample.

Play

- ***Play Selection*** - Plays only the part of the wave you have selected.
- ***Play Loop*** - Plays the loop determined by the loop points of the wave (if any).
- ***Play All*** - Plays the entire sample.
- ***Play Selection Unlooped*** - Plays only the part of the wave you have selected, without looping.

Process

The following set of commands are available for processing the wave (most commands require selection to operate properly):

- ***Fade In*** - Applies a fade in effect to the selection.
- ***Fade Out*** - Applies a fade out effects to the selection.
- ***Normalize*** - Increases the overall sample volume as much as possible before clipping occurs.
- ***Reverse*** - Reverses the direction of the selected part of the wave.
- ***Invert*** - Inverts the polarity of the selected part of the wave.
- ***Stereo <-> Mono*** - Toggles the wave between mono and stereo format. NOTE: When converting from stereo to mono, all stereo data will be lost and can not be restored by switching later back to stereo.
- ***Swap Channels*** - Swaps the left and right channels in a stereo sample.
- ***DC Removal*** - Centers the wave if it has DC offset.
- ***Crossfade Loop*** – Cross-fades the looped section of the sample (not selection!) to fix any clicks or pops at the loop points.

Settings

Opens the wave editor Settings window.

About

Opens a dialog containing information about the wave editor product

Settings

The Settings window of the integrated wave editor provides the following options:

View

- ***Status Bar*** - Displays a status bar displays useful information, such as loop points position, total sample length, etc.

Play

- ***Loop*** - If checked, the wave will loop playback, otherwise the wave is played once and the playback stops.

Record

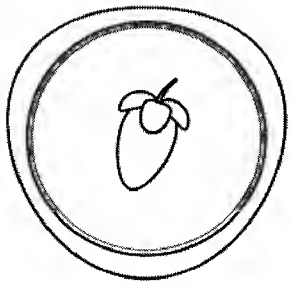
- ***Auto Start FL*** - FL Studio starts playing as soon as recording starts.
- ***Reset FL*** - The song position of FL Studio resets to start when recording.
- ***Recording Time*** - Sets the maximum record time to be used in record mode. Using larger value requires more memory and disk space.
- ***Recording Buffer*** - Increases the recording buffer if the recording is unstable and there are repeating fragments, pops and clicks.
- ***Peak Meter Range*** - Sets the range of the peak meters displayed in record mode.
- ***Crop/Threshold*** – Select if you want to crop the silence on both sides of the wave. The threshold option sets the noise level of the record - i.e. all sound with lower volume than the value specified is considered silence.
- ***Pause Record*** - Recording starts in paused mode so you can adjust recording levels and prepare to start.
- ***Path*** - Sets the location and name to the wave used for recording.

I/O Device

- ***In*** – Select the device to be used when recording.

Loop

Snap to Zero Crossing - If checked, the loop points will be snapped to the first zero sample nearby. This allows smoother loop points to avoid clicks and pops while playing the looped sample.



'A complex system that works is invariably found to have evolved from a simple system that works.'
John Gaule

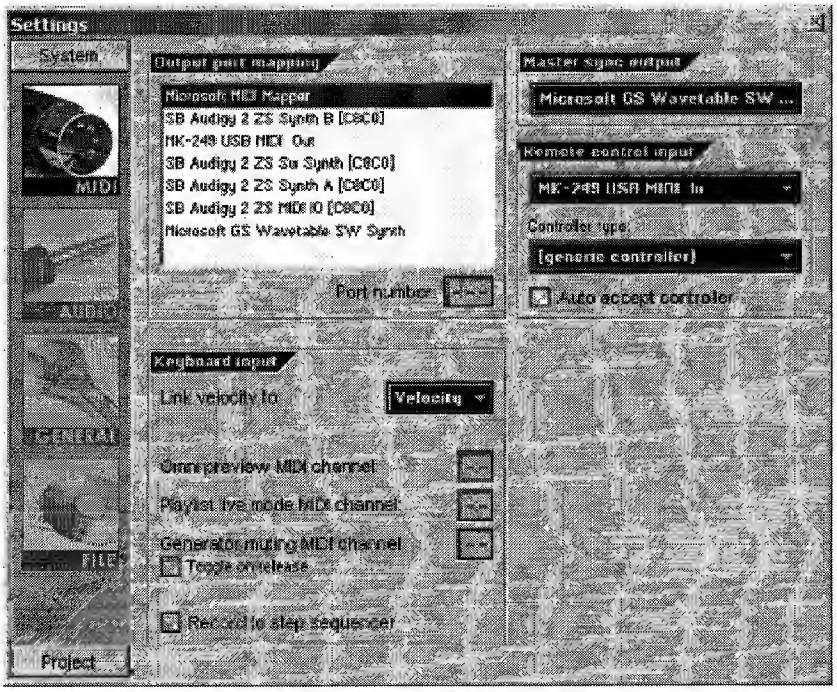
Chapter 11

System Settings

The System Settings window contains options that relate to global system settings, all of which are saved in FL Studio itself, not in the FL Studio loop file (FLP). This section includes - **MIDI Settings, Audio Settings, General Setting, File Settings.**

MIDI Settings

The MIDI Settings page contains fields for setting which MIDI drivers will be used for input, output and syncing. It also contains options related to MIDI keyboard recording and automation. For a list of supported MIDI devices, see the Supported MIDI Devices page.



Output Port Mapping

In this section you can map the MIDI drivers available on your system (such as loopback devices, hardware and software synthesizers etc.) to a MIDI port in FL Studio. To map a device, select it in the list and set a port number in the box below. Selecting '---' in that box means you leave the device unmapped and it can't be used in FL Studio (but it will be free to use with other sequencers/players running at the same time).

Master Sync Output

FL Studio will send master sync signal to the device chosen here (if Enable MIDI Master Sync is turned on in Options menu). FL Studio can be synced as a master with external MIDI devices. You can also sync with MIDI sequencers by using a virtual MIDI cable software, such as MIDI Yoke.

Remote Control Input

This section sets the remote control MIDI device and its settings.

- ***Remote Control Input*** - The device chosen here will be used for MIDI input in FL Studio. Such devices are MIDI keyboards and external MIDI controllers, such as PhatBoy, Drehbank, etc. Additionally, FL Studio supports several types of custom MIDI controllers.
- ***Control Surface Select*** - FL Studio supports all generic MIDI controllers (absolute knobs/sliders). If you use such device, select generic controller in this menu. Additionally, several types of custom MIDI controllers are supported: transport controls, jog, endless (relative) knobs and custom switch controls. If you use a supported device (such as Peavey StudioMix and Tascam US-428), just select it in this list to enable its advanced features.
- ***Auto Accept Controller*** - If you turn this option off, you'll need to click the OK button in MIDI Remote Control box to accept a controller mapping and close the box. When turned on, the box will close right after you tweak a controller on you external MIDI controller device (and that tweaked controller will be mapped to the property). For this option to work, you need to turn the Auto detect option in the MIDI Remote Control box.

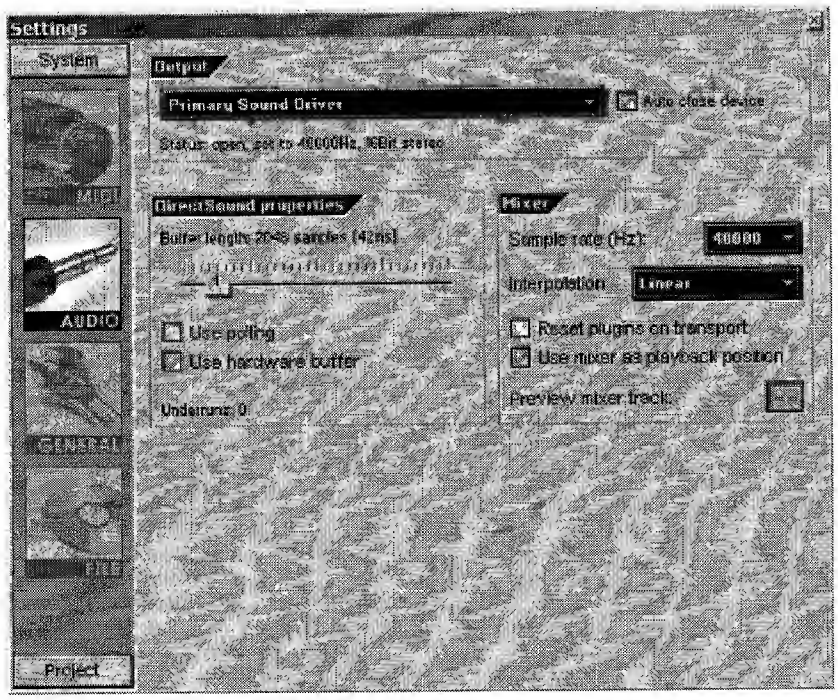
Keyboard Input

Link Velocity to - [none] : if this option is selected, FL Studio will ignore note velocities sent by MIDI input devices (keyboards) and assign 'flat' velocity to all notes. Velocity: enables mapping note velocity from MIDI devices to per-note velocity in FL Studio. Filt. cut/Filt. res: Same as Velocity, however the values are mapped to the per-note cutoff/resonance filter values respectively.

- ***Omni Preview MIDI Channel*** - Lets you set a channel on your MIDI keyboard, where each keyboard key previews one of the channels in the Step Sequencer.
- ***Playlist Live Mode MIDI Channel*** - Lets you set a channel on your MIDI keyboard, where each keyboard key turns on/off one of the patterns in the Playlist window (in live mode).
- ***Generator Muting MIDI Channel*** - Lets you set a channel on your MIDI keyboard, where each keyboard key mutes/unmutes one of the channels in the Step Sequencer.
- ***Toggle on Release*** - When turned on, instead of switching back to the previous state after a second press (in the muting and live mode channels), the state will switch back whenever the key is released.
- ***Record to Step Sequencer*** - If turned on, all recorded notes from your MIDI keyboard will be put in the Step Sequencer, rather than in the Piano Roll.

Audio Settings

The Audio Settings page contains options and settings for wave output.



Output - The device chosen here will be used for wave output. Both DirectSound, and ASIO standards are supported. DirectSound devices have '(DS)' in the beginning of their names, while ASIO drivers start with '(ASIO)'. If your sound card has ASIO drivers, it is recommended that use ASIO rather than DirectSound, because this usually leads to better performance. If you do you use DirectSound drivers, try to avoid those which have '(emulated)' at the end of their name. Using such drivers leads to poorer performance compared to a native DirectSound/ASIO driver.

- ***Auto Close Device*** - Releases the wave output device when FL Studio looses focus, so other applications may use the same output.

DirectSound Streaming Buffer

Visible only when using DirectSound driver.

- ***Buffer Length*** - Length of the DirectSound buffer FL Studio will use. Setting this buffer longer will avoid underruns that may occur while playing songs in FL Studio. Longer buffer, however, also means there will be a lagged response while tweaking knobs and pushing sliders (this does NOT affect already recorded knobs and sliders movements). Lag length is equal to the buffer length.

- ***Use Polling*** – A technique for managing DirectSound audio buffer, which usually allows much smaller buffer without underruns. On some PCs, however, it can have the opposite effect.

- ***Use Hardware Buffer*** - Uses the hardware buffer of DirectSound enabled sound cards.

- ***Underruns*** - Shows the amount of underruns occurring in the current session. An underrun happens when the temporary store that holds audio prior to output to your soundcard runs out of data (a click or pop is usually heard). It means the CPU can't process information fast enough. **There are a number of ways of lowering CPU load including** –

  1. Increasing the latency setting (see page 266)
  2. Switch to ASIO mode (if supported by your soundcard, see the NOTE on page 242).
  3. Decreasing polyphony of the instrument channels (see page 78).
  4. Rendering mixer channels to audio and disabling the instruments feeding that mixer channel (see page 243).

TIP: If you need to **minimize buffer length** (latency), make adjustments and **keep a close eye on the underruns**. When the rate they occur has slowed down to a stop you are at your minimum buffer setting without underruns.

ASIO streaming buffer

Visible only when using ASIO driver.

- ***Buffer Length*** - Shows information about the buffer length the ASIO device will use. This is a read-only property.
- ***Clock Source*** - Some audio cards might provide external clock source which can fix sync/output problems. However, most cards work properly with the default 'Internal' source selected.
- ***CPU Limit*** - Due to architectural specifics of ASIO drivers, high CPU use in some projects might lockup your host computer for some time. Enabling this option allows FL Studio to detect CPU peaks and prevent such lockups.
- ***ASIO Panel*** - Brings up the ASIO driver settings panel.

Plugin output

Visible only when using FL Studio with the VSTi/DXi connection plugin or as a ReWire™ client.

- ***Slave Tempo*** - When enabled, FL Studio will synchronize with the tempo of the host.
- ***Record Automation*** - When enabled, remote control messages (MIDI) from the host will be recorded during recording sessions.

- ***Sample Rate*** - Lets you set the sample rate to be used by the mixer and is also the **sample-rate rendered files will be saved with.**

NOTES: Some older instruments and effects are optimized to run at 44.1 kHz and you may experience problems or altered sound if they are used at any other rate. **Creative Audigy cards,** along with some others, will only run in **ASIO** mode at a minimum of 48 kHz. If you wish to create files compatible with the audio CD format (**see page 276**) please do one of the following -
1. Change to 'Primary Sound Driver' mode and set the sample rate to 44.1 kHz. OR
2. Render in ASIO mode at 48 kHz and convert to 44.1kHz with a 3rd party program.

- ***Interpolation*** - Sets the sample interpolation method used in Sampler channels during live playback (as opposed to the setting during rendering). Interpolation is the process of smoothly creating changes in sample data when the system is called to 'invent' intermediate volume levels between any two known sample points. This happens when samples are transposed from their original pitch. Linear interpolation provides the lowest CPU overhead and good quality, however some audible artifacts may occur. 6-point Hermite applies higher quality curve interpolation, and although slightly more CPU intensive than Linear, is a good choice for critical mixing sessions on fast machines. Sinc (depths 64, 128, 256) method provides the highest quality interpolation of all methods, **but is also very CPU intensive.** This method is too slow for real-time playback. It is recommended that you use it only for your final rendering.

NOTE: The interpolation method and sample rate used for exporting audio files are set in the export dialog. The interpolation and sample rate in the audio settings section will not affect the rendered output.

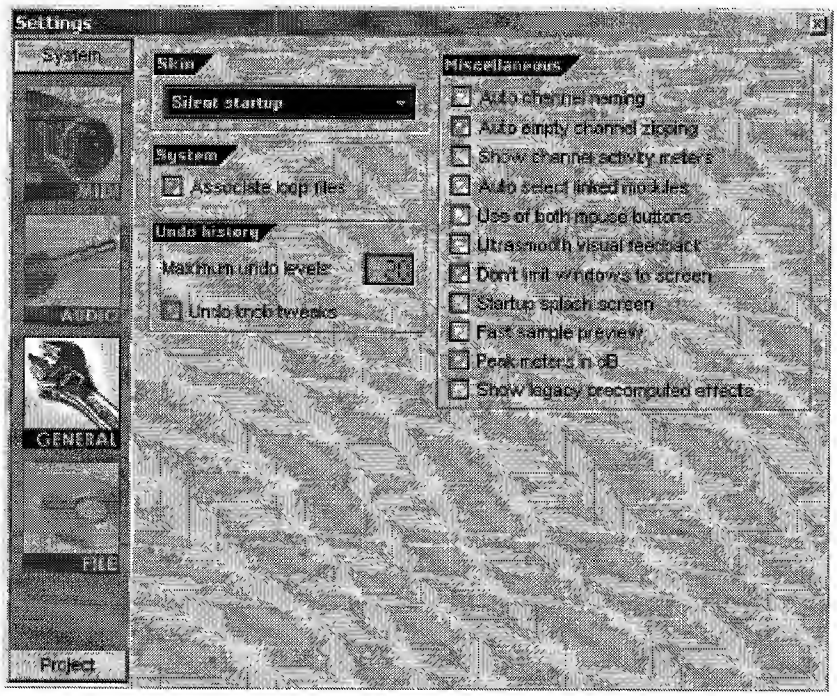
- ***Reset Plugins on Transport*** - Resets all plugins when changing song position, starting playback etc. Uncheck for faster response when changing song position.

- ***Use Mixer as Playback Position*** - Enable this option if you experience unstable position indicators with WDM drivers (usually under Windows 2000/XP). If you don't have any problems leave this option disabled as it reduces position indicator refresh rate with large audio buffers.

- ***Preview Mixer Track*** – Lets you select the mixer track used for the metronome clicks and Browser audio previews. By default, FL Studio mixes those sounds directly in the master track (select none /'--'/ to achieve this effect).

General Settings

The General Settings page contains miscellaneous options and settings of the working environment in FL Studio.



Skin - Lets you choose a skin for FL Studio. FL Studio comes with several pre-installed variations of the default skin.

System

Associate loop files - Associates FL Studio loop files with FL Studio (so they will be opened by FL Studio when double-clicked).

Undo History

Maximum Undo Levels - Sets the maximum undo steps kept in the history (see Project Browser). Fewer steps improve performance, whereas more steps ensure greater editing flexibility within FL Studio.

- ***Undo Knob Tweaks*** - Enables recording of all automatable controls (sliders, knobs, checkboxes) as undo steps in the history. Allows the history to record a much wider set of user actions, however it may cause performance problems with certain plugins, like X-Y Controller and Scratcher. The default value of this option is off.

Miscellaneous

- **Auto Channel Naming** - Automatically assigns a suitable name to the channels. If it's a Sampler, it takes the name of the sample it contains, else the channels take the name of the generator. If a name repeats with the name of another channel, FL Studio will put a number after the name (for example - 'Kick', 'Kick #1', 'Kick #2' etc.).

- ***Auto Empty Channel Zipping*** - FL Studio will automatically zip all empty channels and unzip all non-empty channels when switching between patterns. Empty is considered a pattern that does not contain active notes and notes in the Piano Roll.

- ***Show Channel Activity Meters*** - Animates the activity meters in the Step Sequencer when notes are played.

- ***Autoselect Linked Modules*** - When turned on, the Mixer window will switch to the assigned mixer track as you focus the different plugin editors.
- ***Use of Both Mouse Buttons*** - If unselected left-click sets both on and off dots in the Step Sequencer. If turned on, left-click turns a dot on, while right-click turns it off.
- ***Ultrasmooth Visual Feedback*** - When turned on, FL Studio will update the playing position indicators smoothly.
- ***Don't Limit Windows to Screen*** - Designated for users with multiple monitor PC configurations. It should be turned off on single monitor PCs.
- ***Startup Splash Screen*** - If turned off, FL Studio will not show its splash screen on startup.
- ***Fast Sample Preview*** - When on, FL Studio will not preload the entire sample before playing it (useful for big samples).
- ***Peak Meters in DB*** - Switches to DB format for the FL Studio peak meters (when the pointer is over the peak meter), as opposed to showing the volume like a percent value (0-100%).
- ***Show Legacy Precomputed Effects*** - Some of the pre-computed effects in the Sampler Channel Settings were deleted or replaced in FL Studio 4 and onwards. This option allows you to unhide the deleted effects, so you can work with your older projects.

File Settings

The File page allows you to set additional visible directories in the Browser, as well as additional search paths for VST plugins.

Browser Extra Search Directories

The folders in this section are shown in the Browser and are used for additional search directories when searching for samples during opening of a project.

The Directory column contains the paths to additional directories you will see in the Browser window. You can either double-click the fields to enter these paths manually, or click the corresponding button on the left side of each field to browse the folder. The Name column contains fields where you can set the name that is shown in the Browser for the corresponding directories. Double-click to edit a name.

VST plugins extra search directory

The folder you set up in that section is used as extra path when scanning for VST/VSTi plugins.

Click the browse button on the right side of the panel to browse the extra VST plugins folder.

Project Settings

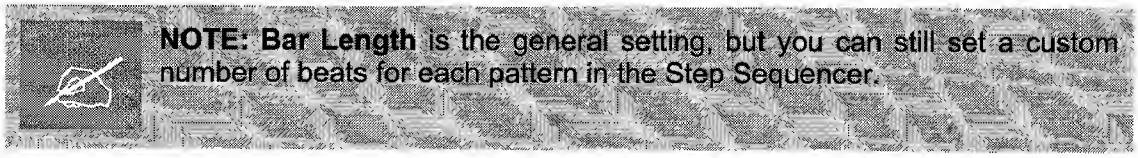
Project Settings window contains settings that are local for each project. All of these settings are not saved in FL Studio itself, but in the FL Studio loop file (FLP), where they are set.

Project General Settings

The Project General Settings page contains the general options of each project file (and they are stored locally in each file).

Time Signature

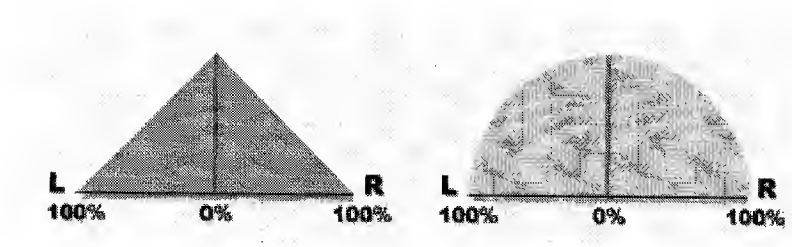
- **Bar Length** - Lets you set the number of beats (as defined by the next option) that make one bar.


NOTE: Bar Length is the general setting, but you can still set a custom number of beats for each pattern in the Step Sequencer.

- ***Beat Length*** - Lets you set the number of steps that make one beat. Starting with FL Studio 5, tempo is synchronized (properly) with beats and not steps.
- ***Timebase*** *(PPQ)* - Lets you set the timebase for the current project. Higher PPQ means a results in more refined events, finer processing of slides, envelopes and LFOs. However, it also means higher CPU usage. The default setting is 96.

Audio

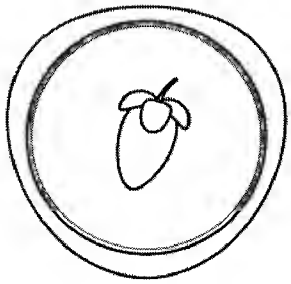
- ***Circular Panning Law*** - If checked, FL Studio will use circular panning (right graph) otherwise it uses pyramidal panning (left graph). These graphs show the 'perceptual' effect of panning a sound in terms of their apparent loudness, where the distance from the 0% point to the edge of the shaded region represents loudness. The circular panning rule results in constant apparent volume while the volume will appear to grow louder with pyramidal panning as is passes through the centre position.



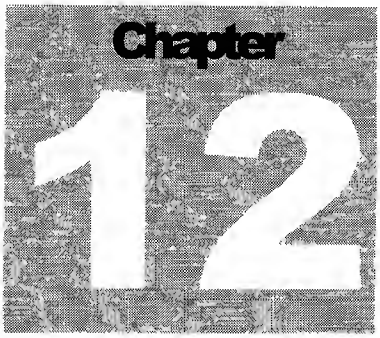
Project Info

The Project Info page contains fields for the song title and additional information about the project.

- ***Title*** - You can write the title of your song here.
- ***Genre*** - Genre for your song. Compatible with those in MP3 and WAV files. Exported when you export your project to audio files.
- ***Author*** – You can enter the project author (composer) here. This information is saved in MP3 / WAV files on export.
- ***Info*** - Here you can write additional information about the song. This field supports RTF (Rich Text Format) data, preserving font, color and other characteristics of the text you paste from RTF clipboard (or from Word, Wordpad, etc.).
- ***URL*** – Here you can write the URL of your homepage, or your email address.
- ***Show it on Open*** - If turned on, a small window will show when opening a project, which shows the title, info and URL (URL can be clicked to follow the link).

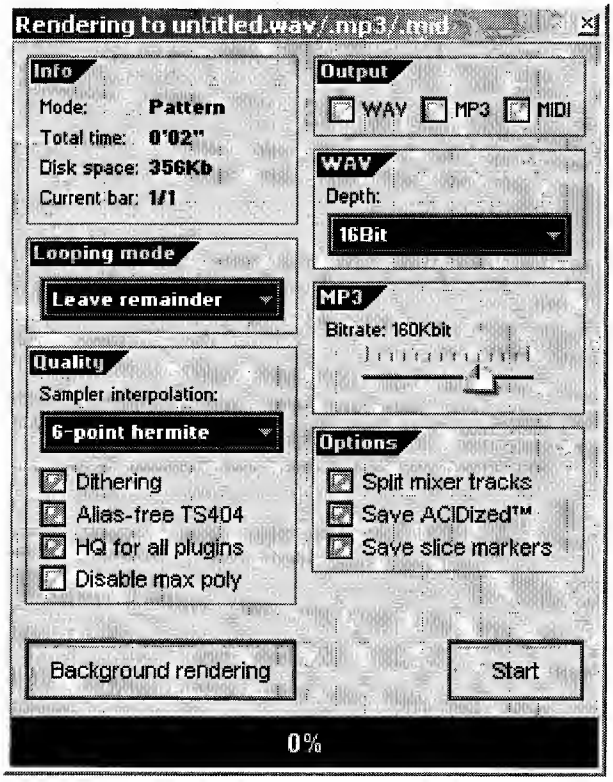


'Total absence of humor renders life impossible.'
Colette



Rendering/Exporting

Rendering is the process of saving the output from a project to an audio or MIDI format. WAV and MPEG Layer 3 (MP3) are audio formats. MIDI is a popular standard for saving note performance data. Choosing to export/save to any of these files formats (Wave, MP3, MIDI) opens the Rendering dialog. WAV and MP3 files export the project.



1. Info

Shows information about the current project.

- ***Tempo*** - Tempo of the current project.
- ***Total Time*** - Total time of the song to be exported.
- ***Disk Space*** - Amount of disk space required to export WAV and MP3 files (includes sizes only of checked file types in Output panel)
- **Bar#** - Shows the current rendered bar and the total number of bars to render (current/total).

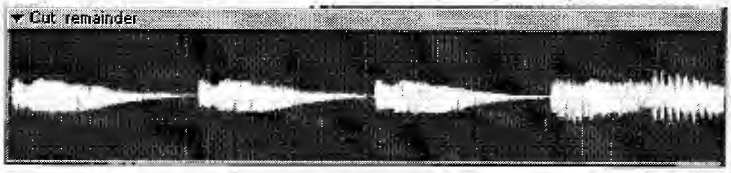
NOTE: Rendering does NOT include any **sound produced by external MIDI instruments**. To include these in the song you will need to record them in FL Studio as audio clips, or combine them with the FL-rendered sound in another program.

2. Looping Mode

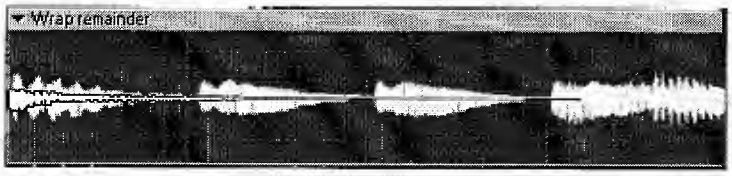
Applies only to WAV and MP3 renders. Looping mode determines how sound after the last bar of your project/loop is used in the final render. For example, the tail of a reverb of a sound may be important for the impression of continuity of sound when looping, or to capture the decay of a reverb in a 'straight' render. If after rendering the last bar from the song there is still a sound decaying, this option sets how FL Studio should proceed.

'**Leave remainder**' leaves the trailing reverb in the tail (note that you can't 'loop' this wav file)

'**Cut remainder**' cuts off the tail (making it loopable but you may hear the cut-off reverb when looped)



'**Wrap remainder**' will merge the tail in the loop making it loop but you may hear the leading reverb)

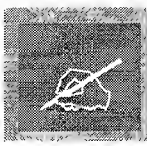


- ***Cut Remainder*** - Cuts any decaying sound after the last bar was rendered.
- ***Leave Remainder*** - Expands song length to fit the remainder.
- ***Wrap Remainder*** - Wraps any decaying sound in the beginning of the song (useful when rendering songs that will be looped).

3. Quality

Sets the quality of the rendered wave output.

- ***Sampler's Interpolation*** - Sets the sample interpolation method used in Sampler channels when exporting to WAV/MP3. Interpolation is the process of smoothly joining points in the digital wave-form. Interpolation is necessary when samples are transposed (played back at anything other than the original pitch) as the original sample points no longer fall in their original places so new ones must be created to fill the gaps. Linear interpolation provides speed and good overall quality. 6 point Hermite is better without any significant reduction in rendering speed. Sync Depth 64 or greater are significantly slower but of the highest quality. You may struggle to hear the difference between the Hermite and any of the Sync Depth methods depending on the music being rendered.



NOTE: These settings can be set independently for rendering and **real-time playback**. Press F10 on your typing keyboard and adjust Audio Settings > Mixer values, see page 266.

- ***Dithering*** - Applies 32->16-bit dithering to 16-bit WAV and MP3 files.
- ***Alias-free TS404*** - Prevents TS404 from 'aliasing' when turned on, but also slows down the rendering.
- ***HQ for all plugins*** - Sets high quality mode for any plugins (effects and generators) used in the song.
- **Disable Max Poly** - Ignores the max poly setting in Miscellaneous Channel Settings. However it will NOT ignore whether you checked the Mono option.

4. Output

Sets the files FL Studio will output when rendering. NOTE: it is possible to render more than one type simultaneously, just select more than one button.

5. Wave

CD format: If you want to create audio files compatible with CD format use **44.1 kHz, 16-bit WAV files**. Check that the mixer sample-rate is set to 44.1 kHz in the Audio Settings window (see Sample Rate Settings page 268). Also note that **FL Studio does not burn to CD format,** it creates audio files ready for burning. Use any 3rd party CD burning program to create the audio CD.

The **combo box** allows you to set bit depth, or the number of steps the volume will be quantized into (e.g. 16 bit = 65,536 steps). You can choose standard 16-bit WAV file, or two types of 32-bit WAV output (provides more precise editing in wave editors that support 32-bit WAV files, but it's likely that you would not be able to play these files in an audio player). 32-bit float (0.24) is the native format of the FL Studio mixer engine, while 32-bit float (16.8) is the native format of Adobe Audition® (also known as Cool Edit®) .

- ***32 to 320*** - Sets the bit rate of the MP3 file exported. Higher bit rate means higher quality MP3, but this also increases disk space required for the file.

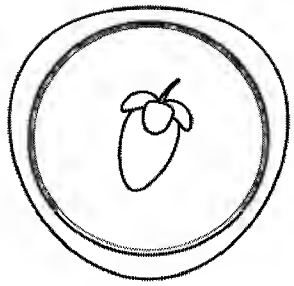
NOTE: MP3 is not a suitable archive format for your important music files as it is a 'lossy' format. Standard CD (16-bit, 44.1 kHz) WAV files use approximately 1400 kb/s (kilobits per second). MP3 data rates can vary between 32 - 320 kb/s. This is achieved by discarding information in the sound according to a 'perceptual coding algorithm'. For example, for any given loud sound at a particular frequency, there will be a range of softer sounds that will be inaudible and can therefore be ignored (taking less space in the data file). At least that's the theory. If the MP3 codec is given enough data space (bandwidth) it can do a spectacularly good job however if the bandwidth is limited then audible parts of the sound are thrown away resulting in audible 'artifacts' such as reduced frequency response and strange 'warbling' sounds

TIP1: What bit-rate is best?: 64 Kbit (or less) is a good bit-rate for demoing tracks where you'd like people to get a feel for your music without obtaining a quality copy. 128 Kbit is excellent for web streaming and e-mailing music files, although some artifacts will be audible it is the point where acceptable 'listening' quality starts. 160 Kbit is the point at which it becomes difficult to distinguish CD from MP3 and is suitable for most distribution and listening purposes. 224 Kbit and above are practically indistinguishable from CD and can be handy when collaborating over the Internet and you need to share audio files of reasonable size. However, where possible it's recommended to use *at least* 16-bit WAV format for sharing raw audio in a production environment.

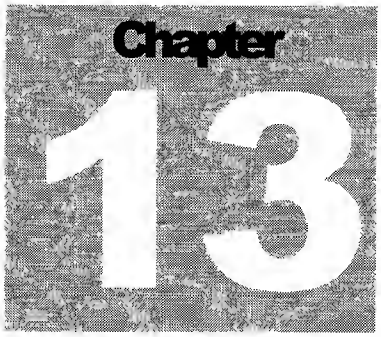
TIP2: MP3 not rendering? If for some reason you can't get FL Studio to render MP3 files, it's possible your LAME codec (code/decode algorithm) has been demolished by another program installation. Reinstalling the LAME codec will probably solve the problem. Go to lame.sourceforge.net/ or Google 'The LAME project' to download the installation files. Alternatively you can re-install FL Studio.

6. Options

- ***Split Mixer Tracks*** - When selected, each effects track in the project is exported as a separate file.
- ***Save ACIDized*** - Saves additional information in the wave file that is read when using the rendered loop in Sound Foundry Acid (TM).
- ***Save Slice Markers*** - If enabled, every note creates a slice marker in the exported file. This means that FL Studio can now export sliced drumloops automatically, ready for slice reordering and high quality time stretching.
- ***Background Rendering*** - Minimizes and renders in background mode.



'Power consists of one's capacity to link his will with the purpose of others...'
Woodrow Wilson



Linking FL Studio to Other Applications

FL Studio can be linked to cooperate with other host applications or act as a host for these applications. There are three standards available, Rewire, DXi and VSTi.

ReWire Support

ReWire is a technology by Propellerhead Software which enables various instruments and sequencers to connect to each other and share common audio and transport functionality, with sample accuracy.

FL Studio supports both client and host mode for a wide range of ReWire applications. The following pages describe how FL Studio implements ReWire and contain step-by-step guides how to use ReWire to connect FL Studio with Cubase SX, Sonar 2 (client mode), ReBirth and Reason (host mode).

Rewire Client Mode

FL Studio can function as a ReWire client with ReWire enabled hosts. When functioning as a ReWire client, FL Studio sends all of its audio output to the ReWire host (providing up to 16 individual stereo outputs). FL Studio synchronizes with the host transport controls as well (playback/stop, song position) and has ability to send and receive MIDI data from the host.

The implementation of the FL Studio ReWire device has the following specifics:

Exported Audio Outputs

When used as a ReWire device, FL Studio provides 16 stereo outputs (32 paired mono channels). By default the first output pair is assigned to the master mixer track, which means the whole project mix is sent to the first output pair. You are free to change this combination to fit your needs. For

example, you can assign each mixer track to a separate output, thus assigning individual outputs to a maximum of 16 individual mixer tracks.

MIDI Support

ReWire allows transmitting and receiving MIDI data via a ReWire connection. The ReWire output bus is represented as regular MIDI output device in the MIDI Settings window of FL Studio.

The ReWire MIDI output is usually linked to port 10, but you can change this assignment to suit your needs (to use it, add a MIDI Out channel set to the same port).

MIDI input works by mapping the first sixteen channels (in order) in the Step Sequencer to 16 unique MIDI channels. To control any of those sixteen channels, simply send MIDI from the host to the appropriate channel number in the ReWire MIDI bus .

Automatic Launch

FL Studio is launched automatically when you activate its ReWire device in the host (since Cubase always activates all existing ReWire devices, FL Studio is launched at the startup of Cubase). Normally there is no need to launch FL Studio from the shortcut after launching the host.

If the ReWire device is activated, but not used, FL Studio will spend a minimum of additional system resources and will add next to nothing to the CPU load.

However, if you don't intend to use FL Studio as a ReWire device at all, you can unregister the device (see below).

Register/Unregister the ReWire Device

You can register (enable) the FL Studio ReWire device by launching the Install Plugin Version shortcut from your Start Menu:

Start Menu > Programs > FL Studio 4 > Advanced > Install Plugin Version

You will be prompted to install the VSTi and DXi plugins first. Click cancel on both boxes and confirm you want to register the ReWire device in the last box.

To unregister (disable) the FL Studio ReWire device, use this shortcut:

Start Menu > Programs > FL Studio 4 > Advanced > Uninstall ReWire Client

ReWire Panel

If a running host which supports ReWire devices and the FL Studio ReWire device is activated, launching FL Studio from the Start Menu shortcut will not display the default interface window, but the ReWire device panel (see below). Clicking the FL Studio logo enables you to toggle the visibility of the FL Studio window inside the host (normally the FL Studio window is automatically displayed after the ReWire panel is launched).

Not a Standalone Process

FL Studio is launched as a process inside the ReWire host. This means FL Studio's window is 'linked' to the host application window. This has the following consequences:

- The FL Studio window is 'linked' to the same taskbar button as the host. Although the panel has its own taskbar button, the actual FL Studio window uses the one of the host.
- Minimizing the FL Studio window hides the host window and vice versa. To hide the FL Studio window only, use the close button instead of the minimize button (this will not terminate the current FL Studio session), or click the icon in the FL Studio ReWire panel to toggle visibility.
- Focusing the host window focuses the FL Studio window and the FL Studio window always appears in front of the host window. If FL Studio obstructs the view in the host, simply move it aside or hide it until it's needed.

General Usage

In most cases you need to follow these steps to get FL Studio running as a ReWire client in a compatible host:

1. Make sure the FL Studio device is registered.
2. Launch the host.
3. If required by the host, activate the FL Studio ReWire device (some hosts do this automatically, such as Cubase).
4. Launch the FL Studio ReWire panel from the standard FL Studio shortcut in the Start menu. Alternatively, some hosts (such as Sonar) provide hide/show panel button which can be used to toggle the FL Studio window visibility.
5. If the host requires it (such as Cubase) activate at least one of the available ReWire audio channels to hear the output (FL Studio has the master output assigned to the first stereo pair of the ReWire channels).

Rewire Step By Step Guides

The following sections describe in a more detailed manner how to use FL Studio as a ReWire client in Steinberg Cubase SX and Cakewalk Software Sonar 2:

Using FL Studio ReWire with Cubase SX

The following guide covers the steps required to use the FL Studio ReWire device with Steinberg's Cubase SX sequencer.

The guide assumes you have read and understood the general information and guidelines about using FL Studio as a ReWire client (see Client Mode).

1. Make sure the FL Studio ReWire device is registered

Registering ensures Cubase will detect the device at startup and launch FL Studio as a ReWire client. If you have disabled the device earlier or you are not sure if it is registered, repeat the FL Studio ReWire device registration procedure.

2. Launch Cubase SX

Launch Cubase SX and start a new project (or open an existing one).

3. Enable the required audio channels

In the Cubase window, open the Devices menu and select FL Studio.

You will see the configuration for the FL Studio ReWire device. This window allows you to select which audio channels are active for the device. By default all channels are inactive.

The default setup of FL Studio links the master mixer track to the first stereo pair of audio channels. So to hear the entire mix, it's enough to enable the first audio channel pair.

4. Launch the FL Studio ReWire panel.

Launch FL Studio from the shortcut on your Desktop or the one in your Start Menu.

Since you have started a ReWire host prior to this (Cubase), you will see the FL Studio ReWire device panel.

The panel automatically displays the FL Studio window in the host.

5. Toggle the FL Studio window visibility

Clicking the FL Studio icon toggles the visibility of the FL Studio window inside Cubase.

If you need to hide the FL Studio window, use the close button in the FL Studio window (this will not terminate the current session) or click the icon button on the FL Studio ReWire panel.

To display the window later, click the icon button again.

6. End

Now FL Studio is setup to work properly as a ReWire device inside Cubase.

To test the setup, load an existing project in FL Studio or activate several steps in an existing channel and hit the play button in Cubase. You will hear FL Studio playing synchronized with Cubase.

Using FL Studio ReWire with Sonar 2

The following guide covers the steps required to use the FL Studio ReWire device with Cakewalk's Sonar 2 sequencer.

The guide assumes you have read and understood the general information and guidelines about using FL Studio as a ReWire client (see Client Mode).

1. Make sure the FL Studio ReWire device is registered

Registering ensures Sonar will detect the device at startup and launch FL Studio as a ReWire client. If you have disabled the device earlier or you are not sure if it is registered, repeat the FL Studio ReWire device registration procedure.

2. Launch Sonar

Launch Sonar and start a new project (or open an existing one).

3. Activate the FL Studio ReWire device

In the Sonar window, open the View menu and select Synth Rack.

This window lets you activate the FL Studio ReWire panel. Open the Insert Synth button (see the picture), select ReWire Device, then click on FL Studio.

4. Show the FL Studio interface.

Sonar's Synth Rack contains the Properties button which lets you show the FL Studio interface. Click the button once to display the interface.

Alternatively, launch FL Studio from the shortcut on your Desktop or the one in your Start Menu.

Since you have started a ReWire host prior to this (Sonar), you will see the FL Studio ReWire device panel.

The panel automatically displays the FL Studio window in the host. Clicking the FL Studio icon toggles the visibility of the FL Studio window similar to the Properties button in the Synth Rack.

5. End

Now FL Studio is setup to work properly as a ReWire device inside Sonar.

To test the setup, load an existing project in FL Studio or activate several steps in an existing channel and hit the play button in Sonar. You will hear FL Studio playing synchronized with Sonar.

Rewire Host Mode

Host Mode

FL Studio can function as a ReWire host for installed ReWire devices. The host functionality is implemented via the ReWired plugin. Each instance of the plugin lets you host one ReWire device (to use multiple devices, simply add multiple instances of the plugin to your project).

The ReWire client sends all of its audio output to the ReWired plugin. The client synchronizes with the FL Studio transport controls as well (playback/stop, song position) and provides ability to transmit MIDI data from and to the ReWire client.

Parameters

- ***Client*** - Here you can select the ReWire device to host.
- ***Show Panel*** - Once you select the client, click here to launch the ReWired application.

NOTE: Some ReWire clients may not launch from this button (such as ReBirth). In this case simply use their Start Menu shortcut. The ReWire client will detect the FL Studio host automatically at startup.

- ***Online Device Information*** ('?' button) - Click this button to open your default browser and see more information about the ReWire client currently set in the Client combo box. You need to be on-line to use this feature.
- ***Multi Outputs*** - Normally the whole mix from the ReWire client will be sent to the mixer track the ReWired plugin is linked to. If the ReWire client takes advantage of the multiple audio outputs ReWire supports, you can enable this option to send each ReWire output to an individual mixer track. For example, if ReWired was linked to track 10, output 1 will be sent to track 10, output 2 to track 11, output 3 to track 12 etc.
- ***MIDI Options*** - Launches the MIDI output dialog where you can map ReWire MIDI busses (input and output) to standard FL Studio MIDI ports. For more information, see 'MIDI Connectivity' below.

General Usage

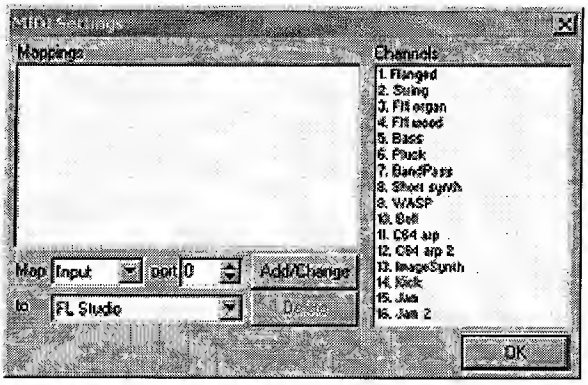
In most cases you need to follow these steps to get a ReWire client connect to FL Studio:

1. Add an instance of the ReWired plugin.
2. Select a ReWire device from the Client combo box (if the device is not present in the list, make sure the ReWire client is properly registered/installed).
3. Click the Show Panel button to launch the ReWire client (this button might not work properly with some clients, in this case launch the application manually from its Start Menu shortcut, but always after you have selected the client in the ReWired plugin).
4. Now the client is connected with FL Studio. Its audio output streams into the ReWired plugin and the playback and song position is synchronized.

After you have completed this setup you can also make use of the MIDI connectivity features of ReWire (if the client supports it), see MIDI Connectivity below.

MIDI Connectivity

ReWire allows the host (FL Studio) to send and receive MIDI data from the client.



FL Studio implements this functionality by mapping the ReWire input/output MIDI busses to regular FL Studio MIDI ports. To adjust the MIDI mapping settings, click the MIDI Options button in the ReWired plugin.

For this functionality to work, the client needs to make use of the MIDI connectivity features of ReWire, otherwise the controls in this window will be empty/disabled.

- ***Mappings*** - Displays any existing mappings you have created for this ReWire client.
- ***Map*** - Lets you select Input or Output port to map. Input port sends MIDI data from FL Studio to the client, output port maps MIDI data coming from the client to FL Studio MIDI port.
- ***Port*** - Lets you select the FL Studio MIDI port to map.
- ***To*** - Lets you select the ReWire MIDI bus the port will be mapped to.
- ***Add/Change*** - Adds the mapping you've defined via the Map/Port/To control to the Mappings list.
- ***Delete*** - Deletes the selected mapping from the Mappings list.
- ***Channels*** - The list displays the synths/controls that are linked to each of the channels for the currently selected ReWire MIDI bus (selected by the 'To' combo box). The list is informative, you can not edit the assignments.

You can perform several operations with the MIDI connectivity provided by ReWired:

Control the client via MIDI

To control the client and its synths from a MIDI Out channel, you map an input port to a ReWire MIDI bus. To do this:

1. Via the MIDI Options of the ReWired plugin, map an input port to a ReWire MIDI bus.
2. In a MIDI Out channel, set the same port as an output port.

3. In the MIDI Out channel, select the MIDI channel to use (you can look at the Channels list in the Options window for a reference of the channel assignments).

Control a VSTi/DXi plugin from a client

1. Via the MIDI Options dialog of the ReWired plugin, map an output port to a ReWire MIDI bus.
2. Make sure the client is set up properly to send MIDI data to the same ReWire MIDI bus.
3. In a VSTi/DXi channel, set the same port as an input port.

You can use similar setups to control a ReWire client from another ReWire client or send MIDI data from a VSTi/DXi plugin to a ReWire client.

NOTE: Even if no mapping exists for a ReWired plugin, adding a sequence for it (events, notes etc.) automatically sends the generated MIDI data to the default ReWire bus. It is recommended to use MIDI Out channels for greater control over the MIDI data mapping.

Using FL Studio ReWire with ReBirth

The following guide covers the steps required to use the FL Studio ReWire device with Propellerhead Software's ReBirth 2.01.

The following assumes you have read and understood the general information and guidelines about using FL Studio as a ReWire host (see Host Mode).

1. Add ReWired to the project

Add an instance of the ReWired plugin to your project.

2. Select a Client

Select ReBirth Audio from the Client combo box of the ReWired channel.

If ReBirth Audio is not present in the list, make sure ReBirth is properly registered/installed. Keep in mind only ReBirth 2.01 and later support ReWire, ReBirth 2.0 and earlier can not connect with FL Studio.

3. Launch ReBirth

Launch ReBirth from its Start Menu shortcut.

Now ReBirth is operating as a ReWire client for FL Studio. All of its output streams into the ReWired plugin and the playback and song position is synchronized.

Using FL Studio ReWire with Reason

The following guide covers the steps required to use the FL Studio ReWire device with Propellerhead Software's Reason 2.5.

The guide assumes you have read and understood the general information and guidelines about using FL Studio as a ReWire host (see Host Mode).

General Usage

1. Add ReWired to the project

Add an instance of the ReWired plugin to your project.

2. Select a Client

Select Reason from the Client combo box of the ReWired channel.

If Reason is not present in the list, make sure Reason is properly registered/installed.

3. Launch Reason

Launch Reason from its Start Menu shortcut.

Alternatively, use the Show Panel button in the ReWired channel.

Now Reason is operating as a ReWire client for FL Studio. All of its output streams into the ReWired plugin and the playback and song position is synchronized.

Controlling Reason via MIDI

Reason provides access to many of its controls and synths via the ReWire MIDI busses. To make use of this feature, you need to set a MIDI Out channel in FL Studio to a specific port/channel which is mapped to the ReWire MIDI bus of Reason:

Open the MIDI Options for ReWired

Click the MIDI Options button for the ReWired channel that is linked to Reason.

Map Input Port

To send MIDI data to Reason, you need to map an FL Studio input port to the ReWire bus.

Use the following settings to create a new mapping:

- ***Map***: Input
- ***Port***: 50 (or any free MIDI port you have)
- ***To***: Reason

Click Add/Change and the mapping appears in the Mappings list.

Create a MIDI Out channel

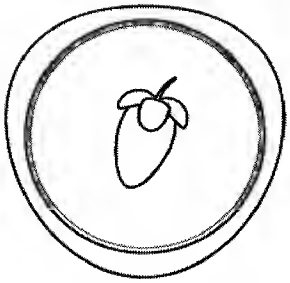
Add an instance of the MIDI Out channel to your project.

Adjust the MIDI Out settings

Set the output port of the MIDI Out channel to 50 (or the port you have selected to map earlier).

Reason 2.5's default project contains a controllable synth on channel 2 - MelodyB (for a full list of synths, check the Channels list in the ReWired MIDI Options window), so select channel 2 in MIDI Out.

Now any notes you play in MIDI Out are sent to Reason and played by MelodyB. You can add additional MIDI Out channels to control the other available channels as well.



'Programming today is a race between software engineers stirring to build bigger and better idiot-proof programs, and the universe trying to produce bigger and better idiots. So far, the universe is winning. ' *Unknown, but sounds like something Didier would have said.*

Chapter 14

FL Studio History

After doing stock market software with **Pavell Software** (www.pavell.com) for about 7 years JMC & FVB wanted do have some fun. They quickly turned a previous Tetris clone into an 'adult' game and offered it on floppy disks in the 'little adds' of Computer Magazine. Surprisingly enough this caught on and people asked for more.

JMC: "This was the time CD Rom games like 'The 7th Sense' started to appear and we decided to do a CD ROM and got in bed with Private, one of the bigger players in the adult games market. They released a whole bunch of our CD Roms including Private Prison and Private Castle.

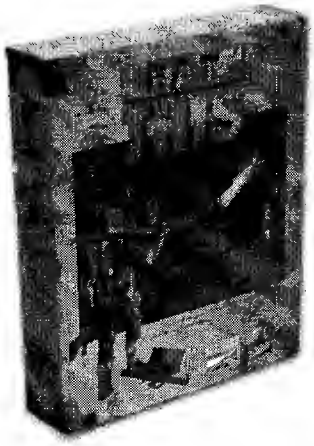
Spelletjes als Formule I voor financiële software

Around the same time **IBM** launched the "Da Vinci" contest where the first prices were color laptops (which costed about $8000 then). As Image-Line didn't have a lot of cash to spend on laptops they turned one of the game environments into a more or less related

game, mailed it in and won the first price in the multimedia category. This contest even got us some national (Belgian) press & TV coverage where we cooked up a fake story about how our 'games department' brought new ideas and technology to our 'stock market department' like the Formula 1 teams brings new technology to the 'regular' car industry...

The most interesting part about this whole thing however was a 19 year old developer called **Didier Dambrin** (nicknamed **Gol**), who not only won the 'Game' category but also won the 'Overall' prize (a trip to the US) plus the laptop.

We immediately noticed the talent he had and convinced him to work for us. Gol's first game for us was **Private Investigator**. This was our last adult product and it was pretty sick. The fact that you had to shoot & kick old ladies & MBA players close to a wall in order to use their bodies to jump higher caused the rapper **Ice-T** to shout : "*This game beats cocaine!*" ... after playing if for like half an hour on our booth on the adult show in Las Vegas.



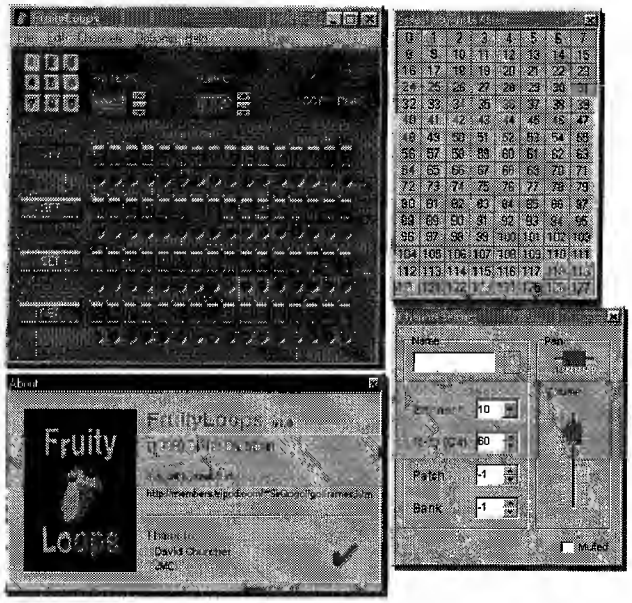
Anyway : As this whole adult adventure was getting us a pretty bad name around here (and didn't bring in any real money) we decided to use Gol's talent for something better and asked him to develop a platform game called **Eat This**.

Sadly enough for us this was the time that everyone went 3D and most of it went by unnoticed. You can still download & check out the demo on www.eatthis.com. It's a really cool platform game and it really shows of Gols coding & visual skills.

The rest of our developers continued on our other products like **Fact2000** (invoicing software), **E-OfficeDirect** (a content based web tool). We even topped the Belgian game charts 4 years in a row with the CD version of a popular Belgian TV show called **Blokken** (funny enough based on Tetris as well ☺).

In the meanwhile Gol got drawn into the music scene by apps like **Hammerhead** and **Rebirth**. As he wanted to merge both apps into a stepsequencer with rows and steps he started developing **FruityLoops.** When he dropped it on our machines it was a simple, midi-only stepsequencer that we really couldn't place inside the range of products were doing at that point. What we DID notice was the fact that people got WILD about it and sucked our servers dry (downloading the demo) in no time.

The first couple of years were pretty tough as there were hardly any sales and we always had to fight & beg to find servers that wanted to host the demo (thanks Maz!).



To gather some income, Gol developed an **EJay** clone called **FruityTracks** that was "OEMed" for **Mattel** into **Pro-DJ** (for France & UK) and **Radio 538 Music Machine** (for Holland & Belgium).

In the meantime Fruityloops grew from a simple midi drum machine into the fully featured virtual studio you are all using now (you can check out the history of FL here: www.flstudio.com/history) and E-OfficeDirect grew into EZGenerator (check it out at **www.ezgenerator.com**), one of the best tools to quickly build a decent website. You may have noticed the www.flstudio.com site is built with it as well.

How Fruityloops became FL Studio ...

After doing Fruityloops for about 4 years we changed the name **FL Studio** for several reasons :

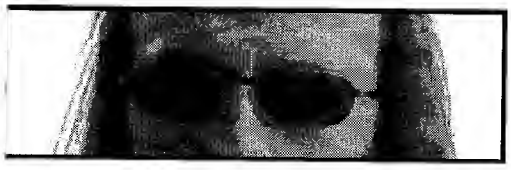
1. **Kelloggs** came after us since we applied for the FruityLoops trademark in the US. We have a very strong case **AND** we received the trademark in Europe as the two markets are obviously separated but later they claimed to have released CDs & games in their cereal boxes & as we didn't have the money to fight them in court for 5 years ...
2. **'Fruity'** seems to means gay to a lot of (US based) users. Not that we have anything against gay people, but as we didn't want to miss out on the hip hop crowd ... ☺
3. The **'loops'** part implies you're making music using pre-canned loops and no 'musician' wants to be associated with that. We even had customers losing a job because their customers believed they used a 'pre-canned loops' app.
4. In the opposite direction people buying **'Fruityloops'** thinking it's an **Acid/Ejay** alike app didn't have a clue what's going on when the were confronted with a stepsequencer and Pianoroll.
5. No one ever took the name seriously. Whenever we went up to a meeting to discuss a possible bundle with a piece of hardware we had to excuse ourselves and explain it WAS a decent app for half an hour while the marketing managers on the opposite side of the table were looking at us with a grin on their face.

Anyway. Since we changed the name we have received a lot more credibility and our users seem no longer ashamed to admit what app they are using for their music."

Staff Interviews

The Image-Line team were asked to respond to a set of standard questions. In typical 'Belgian' style, the answers are short and to the point ☺.

Didier Dambrin (GOL)



Gol is the Chief Software Architect at Image-Line and is responsible for the overall design and direction of FL Studio. If you want to talk to gol he frequents the LoopTalk forum at the FL Studio website, who knows you may get lucky ☺

Where are you from?

Civitas Tornacensium (all I remember from Latin courses) [Editor: Gol currently lives in Belgium :)].

What do you do at IL?

Giving Fred boring stuff to do :)

What CD's/albums/bands best describe your musical tastes?

I really I don't know.. I've been mostly listening to video game music remixes for the last few years :) I would have said the prodigy, but since the last album was made in reason & sucked at the same time.

What are your interests outside music?

toys & cat pics!

What single URL sums you up?

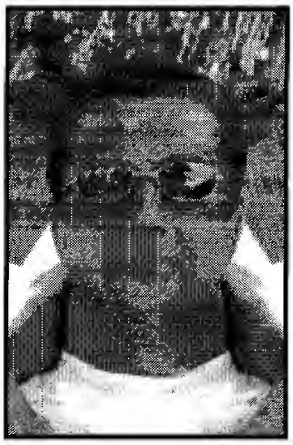
www.google.com/search?hl=en&lr=&safe=off&q=599%2B2

Where do see FL Studio in 5 years?

in \Program Files

[Editor: OK Gol seems to be a man of few words, so we have tracked down a previous interview with Sonikmatter for those of you wanting to know a little more about this often mysterious IL employee, see chapter 15].

Jean-Marie Cannie (JMC)



JMC is a joint owner of Image-Line and Chief Technical Officer.

Where are you from?

Belgium, Sint-Martens-Latem.

What do you do at IL?

Let's call it CTO : Trying to get things done technically (begging Gol & Fred to develop stuff they don't like) so we have a new version ready each September.

What CD's/albums/bands best describe your musical tastes?

My first album was Power Ace (ACDC), after that I bought most of Iron Maiden, Motorhead, Judas Priest, ...These days I'm just listening to what's hot over here : scissor sisters, Black Eyed Peas, Anastasia, Kane, DJ Tiesto, ...

What are your interests outside music?

Soccer, Wakeboarding, Snowboarding, Kitesurfing, chicks, & cars

What single URL sums you up?

www.jm.cannie.be

Where do see FL Studioin 5 years?

Bundled with Windows :)

Frank Van Biesen (Frank)

I am joint owner of Image-Line and responsible for sales & legal stuff (boring!). I am also trying to push EZGenerator (www.ezgenerator.com) - our website building software.

Where are you from?

Aalst, Belgium.

What do you do at IL?

Monitor sales; OEM deals; legal stuff; everything else that nobody likes to do :-) Trying to give EZGenerator the chance it deserves (see page 350).

What CD's/albums/bands best describe your musical tastes?

You wouldn't suspect it, but I am a classical dance teacher and about 23 years ago, I was among the Belgian talents for Ballroom & Latin dancing. So my music is more in that area. I like big bands and acoustic stuff.

What are your interests outside music?

Tennis, Golf (still going down ... in handicap and still full of ambition), sport in general.

Get drunk every Friday with my friends at the tennis club (as it is Saturday today, I still feel my head banging :-).

What single URL sums you up?

www.cyriank.be - Cyriank = CYnthia (little girl) + mYRIAm (love of my live and the girl chasing customers to pay their invoices) + frANK (me)

Where do see FL Studio in 5 years?

Everywhere?

Frederic Vanmol (Reflex)

Reflex is Gols right hand man (nice hair! ☺ btw), here's what he had to say -

Where are you from?

Genk, Belgium. Now Gent, Belgium (note the subtle difference).

What do you do at IL?

Programming. Stuff Gol doesn't want to do :)

Favorite music/bands?

Radiohead, Sophia, Cake, dEUS, Eels, Nick Cave, Tom Waits, ...

What are your interests outside music?

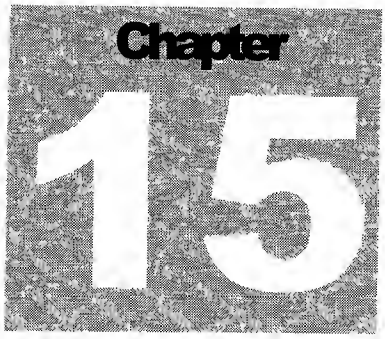
Reading, pool, movies

What single URL sums you up?

www.nanowrimo.org

Where do you see FL Studio in 5 years?

In Marbella (Editor: Sunny Spain).



'Trying to develop software with multiple developers is like trying to make a baby in one month with 9 women'
Unknown.

Interview with Didier Dambrin

As you will have learned in the preceding chapter, Didier Dambrin (gol) is the Chief Software Architect of FL Studio, however he is also a man of few words, so we give you the following Interview by Rick Wishart, reprinted with permission from Sonikmatter, LLC (www.sonikmatter.com).

Sonikmatter: What's your background in music and programming?

Didier: Unfortunately I have no musical background. I started programming a long time ago, mainly on bad video games, to finally end up with satisfactory platform games. But as the game industry started to become too big (we made a commercial platform game that came out a couple of years too late), I tried the compromise between video games and technical tools: musical applications, as they were/are easier and almost as fun to work on as a video game.

I in fact made a classic music 'tracker' a long time before FLStudio, an OPL3 (the musical FM chip in early SoundBlaster cards) tracker called 'ZIC', which probably no one ever saw or used. It was a poor old DOS tracker with a very Scream Tracker-like interface, supporting many formats and allowing control of the OPL chip in depth.

But that was years before FLStudio, and when FLStudio (FruityLoops) started I couldn't even remember how many semitones per octave there is, in other words, it didn't really help.

Sonikmatter: What games and platforms did you program?

Didier: It all began with the Amstrad CPC but never went far - this was with a breakout game, removing the ball and replacing the racket by a little guy [the standard charset of the CPC had a couple of funny guys and a rocket in it] freely moving at the bottom of the screen got me stuck into programming. But it really started with the PC, for which I made a lot of crappy games, for example, like about every programmer, a tetris clone with the very original name of "T-Tris"! This is hard to find now as I don't have a homepage anymore. Before the internet was popular, it was so hard learning how to program, as technical information or just a little piece of

code wasn't easy to find. Now it's much easier to start programming, and 32-bit programming is also much easier than 16-bit used to be.

An ok game that can still be found is 'Space Bastards' (a small shooter game, nothing to do with another one called 'Robosaurs vs the Space Bastards'). Even works under Windows 3.1.

The last and better game was a platform game called 'Eat This', made by Image-Line, just before FruityLoops. You can try www.eatthis.com. Took too much time to finish, while the hardware didn't wait, so it was a little outdated, unfortunately. But it got sold.

Sonikmatter: What's your view of the game industry these days?

Didier: It's so big - it's probably not as fun to work on a game anymore. But the results are worth it (for the gamer that is), games (well, not all of them) are so amazing. Technically that is, because only a few games are fun to play. And thank goodness for online games, even if they're partly the reason that PC games are selling a little less. If you've never played it, a very good game (though rather old now) I'd recommend is Rune. But you've got to like vikings.. and chopping heads.. and eating lizards...

Now I also like and play old arcade games, especially fighting ones, a lot. I miss 2D games!

Today everything has to be 3D. 3D graphic chips roughly appeared at the same time as support for high-res screen resolutions and colors, so there never really was any good slick-looking 2D games, except Oddworld (which is now 3D on the XBox, and looks great, but definitely not as slick as the first episode). Classic 2D arcade games of the 90's, and I'm not talking about Pacman, but post-Double Dragon games, could have become something great with modern display resolution and color depth. There are of course a lot of 3D games with 2D gameplay, but they don't look as good - though it will probably change in the future.

2D games on the GameBoy Advance (though the GBA also suffers from the '3D everywhere' syndrome and has some poor fake-3D games) are cool. After the GBA (when pocket consoles will have a good 3D chip that is), 2D games will probably revive in cell phones, and will then die.. until graphic cards will be so powerful that gameplay will have as much value as display.

But this has nothing to do with music applications, and I haven't even commented on the musical games that seem so popular in japan!

Sonikmatter: When did the genesis of FLStudio begin?

Didier: It was, if I trust the history file, in 1998. It didn't start seriously, because at that time there were only 2 interesting (read: fun to use) music apps, Rebirth 338 and the Hammerhead drum machine. I wanted to merge the coolness of both in a drum machine that wouldn't have their main limitation, that is a single row of 'steps' shared between all the drums. The first FLStudio was named 'FrootyLoops' [Editor: later changed to FruityLoops then FL Studio]. The splash screen already featured a fruit, with a worm in it and then I was told that the worm looked like a penis (although it had eyes, go figure), and so the worm was removed!

The difficulties were mainly in Windows programming, as my previous apps had all been made with the old Borland's Turbo Pascal, today known as Inprise's Delphi. I think the strength of FL Studio is mainly in its interface. I guess that old trackers had such success because they looked appealing, while big sequencers had boring silver interfaces, and were showing all of their complex features at once, scaring most people.

Sonikmatter: What inspired and influenced the user interface design of FL Studio?

Didier: Graphically, probably old trackers, the fun ones, like the mighty FastTracker 2. As for the colors, a little of ReBirth 338 maybe, but that was for Fruity before version 3. As for the layout, it might be closer to a DOS app in a way, since it's made to work fast and has many keyboard shortcuts. It also doesn't really follow standard Windows rules, as many features aren't accessible from the keyboard, and the right mouse button is used a lot. But I find it easy and intuitive, and it's often said to be (as opposed to the famous sequencers), so it must be!

Sonikmatter: Do end-users suggestions influence the ongoing development of FL Studio?

Didier: The delicate art here is to make the end-users believe they have influence, but not to follow their tips slavishly!

Honestly many users come up with either weird, or stupid ideas, or completely undoable things. When the requested features are good and doable, they're usually already being worked on, or sometimes even done already or in the planning stage.

There really are enough things on our to-do list not to need more stressing feature requests!

This might sound pretentious, however in my humble opinion it's more pretentious to think that no one else ever had our 'new wonderful idea'. Usually someone else had it, and sometimes it's already materialized somewhere, if not, it's more because it's harder to achieve than to think of!

Sonikmatter: Do you do all the programming for FL Studio?

Didier: I do all the programming for the FL Studio application. Several FL Studio plugins, or the engines they use, are made by various people, who are usually the best at what they do. Frederic works on side things, like support for VSTi and DXi plugins, other apps like FruityTracks, etc. JM manages the web sites and the Image-Line company with Frank. Yes it takes a lot of time, so it's better not work on anything else. The next version of FL Studio is always better, or should be!

Sonikmatter: What made you choose the developers for the FL Studio plugins?

Didier: Simply the fact they had made plugins already, or proved they could do it. For example, Ultrafunk had a very good, and cheap, DirectX reverb plugin. So we asked them to develop a version of it especially for FL Studio. Good reverbs aren't that easy, all of the lame freeware, not that freeware means lame, reverb plugins are proving it. Another example is the

Wasp plugin, developed by Richard Hoffmann who originally made the TS404 bassline synth in early versions of FL Studio. That TS404 was itself a standalone product of him.

Sonikmatter: What features do you feel users don't fully utilise?

Didier: Automation, definitely. FL Studio gives a lot of means to automate things, and about everything can be automated. But it's not used enough. Or it's used for fun - you can do complex things by linking knobs to internal controllers, there even is a 'formula controller' plugin - but not enough in song projects. Though now it's starting to be used more and more, as the users start to master the recent features.

Sonikmatter: What's your view on Cubase, Logic and Sonar?

Didier: They are classics. You know, like books, that you wished you had read, but don't want to read. They're the ones that are supposed be used, but are too scary because of their complexity, and you don't really 'want' to learn them. So if you don't actually have to learn them, it's hard to start, and I never dared to. That's my opinion for Sonar and Cubase, as I don't know Logic, which seems to have a worse learning curve. They're probably the best tools for what they're supposed to do, but they're certainly not applications you can use for fun or have fun whilst using.

Sonikmatter: What's your viewpoint on the ongoing 'software' versus 'hardware' debate in synthesis?

Didier: I'm not at all into hardware, so I don't really know that side. I think that the difference in easiness is unbeatable, no one would say that a piece of hardware is easier to use than a piece of software, or better integrated in a sequencer. Some say they prefer to tweak real knobs, but you can control a piece of software using a hardware controller. A big advantage of hardware has always been the near-zero latency, but today's good soundcard drivers will give you a very small latency as well. So that leaves the main argument: the sound quality. Most of today's pieces of hardware apparently being based on software running on a dedicated processor, proves that a software can do what a piece of hardware does. The question is then not 'can software match hardware?', but 'can today's software match the quality of today's hardware?'. This implies both talent of programmers and speed of our CPU's. Both of them are improving with time!

All I've heard from hardware synthesizers never amazed me, except the Virus maybe. As for effects, I don't know enough to give an opinion. Maybe hardware reverbs sound better, I personally wouldn't notice the difference.

It's true that dedicated processors will obviously be faster, but also less flexible, at what they're made for than a general processor. But DSP chips in music hardware are also much slower in terms of clock speed than today's CPU's. The ideal is probably a dedicated sound processor in the soundcard itself, all controlled by a software UI (Creamware's Pulsar, etc.).

Globally it seems that for many people it's more a matter of 'magic and myths'. Give someone two exact same pieces of sound, tell that the second piece of sound benefits from some

marketing bullshit name, and the second will sound 'better'. That's why I don't much like studio engineers (and I'm probably making new enemies by saying this), they seem to propagate those myths, and often someone claims that 'this' is the way to do things, simply because that's the way a studio engineer does it. "This must be good or all sound engineers wouldn't do it!". "This must be better or all the studios in the world wouldn't have one!". But often they just can't explain why. Sometimes there was a real reason behind those arguments, and sometimes that reason simply isn't worth anything anymore as it was related to limitations of past hardware. Take, for example, dithering. Of course dithering matters a lot in a 8-bit piece of sound, but everyone seems to be claiming that dithering to a (final - not to be post-processed) 16-bit piece of sound matters, while I never could get a proof of anything, and personally can't hear noise at above 15 bits of depth in a common piece of music. That's misleading for some new musicians who seem to think that the reason their piece of music doesn't sound like what they hear on radio is the lack of dithering, while they'd be better spending their time investigating equalization and compression, or in some cases, talent! But that won't prevent 24-bit 96Khz audio DVD's generating big money.....!

Sonikmatter: Who are the other software developers you admire?

Didier: The one that started it all was Rebirth 338 so of course I admire Propellerhead's products. Especially as their interfaces feel nice. I don't quite like their way of imitating hardware, including disadvantages of it, though. Orion is nice as another 'all-in-one' software studio. And finally I respect the old-school trackers, they were there before us after all.

Sonikmatter: What do you enjoy doing in your spare time?

Didier: You mean what would I do if I had spare time ? I'd be playing Return to Castle Wolfenstein, frying everyone's balls with my flamethrower, and finishing them with my knife! These days I'm really into remixes of old computer songs. Take old C64 SID tunes for instance which were mostly from games. The SID chip wasn't that great, so at that time they had to work on great melodies. Combined with today's possibilities, such remixes sometimes are jewels. I like all kinds of music, except lame pop, r&b, and French pop (today's French music - rap or electronic - is good, but a decade ago we suffered a lot from crappy French-speaking songs.....oh, wait.. it's back again!). As most people interested in electronic sounds, I of course can't forget J.M. Jarre and Vangelis. One of my favourite CDs is "Behind the Sun" by Chicane - really great, especially that 10 minute long 'Saltwater' song.

Sonikmatter: So after a hard day's programming what's your favourite food?

Didier: These days it's crayfish with aioli sauce. Until I'm tired of them.

Sonikmatter: How did Gorbachev come to feature in some of your earlier promotional material?

Didier: Well it wasn't some Russian-Italian mafia connection given he appears to have a picture of Italy on his forehead! Actually it was because pictures of Gorbachev are some of the easiest pictures to find on the net. That was before Google's amazing image search-engine was available though.

Sonikmatter: So after all this interesting conversation would you consider sharing a photograph of yourself with Sonikmatter?

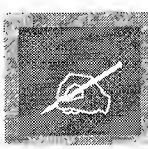
Didier: Argh! I'm afraid not. I don't have any scanned, and in fact I don't have any recent ones except for the one on my ID card, and like everyone else I'd prefer to die rather than to show it! [FL Editor, but we do ☺]

'The Power of Love?'
Franky

Chapter 16

The FL Studio Power Users

We are often asked whether any well known artists are using FL Studio or if any of our users have been signed with major record labels. So we decided to interview a couple of our 'power users' about how they got involved in music and how they started using FL Studio. The answers are not always what you may expect...



NOTE: You can download project files from most of the Power Users mentioned here at **www.flstudio.com**. Check the 'Extra' tab in the main menu and then click on 'Power users'.

Mike Oldfield

We accidentally found out that Mike Oldfield was using FL Studio when we saw the FL Studio sample settings dialog on one of his screens in an article in 'The Times'.

When we contacted him to see whether it was true he was using FL Studio and whether he wanted to endorse the software he answered :

'First of all many congratulations for a most excellent software product I have been most impressed by FL Studio with it's many creative possibilities and helpful user friendliness. I would be happy to give you an endorsement.

For your information I am using FL Studio as more than a scratchpad for the new Album. The disk recording abilities mean that it can completely replace the studio next door.'

How did you get involved in creating music ?

My dad had a guitar hanging on the wall and when I was about 8 I took it down. He taught me 3 chords C, F, and G after that I was only interested in playing guitar and making music.

I started off playing in local folk clubs around Reading where we lived at about 10 years old then I got an electric guitar and had a band called Barefoot. At 15 I made an Album with my sister Sally and at 16 I joined a band Called Kevin Ayres and the Whole world and we toured around the UK and Europe for 2 years. I recorded Tubular Bells at 19 and then I guested with a few people but not much.

How did you end up using FL Studio ?

I found it through searching for music software for PC because my Mac and it's software had become very complicated and unreliable.

What does FL Studio mean in your current setup ?

For a start I can work in a different environment than in my studio. I have a small conservatory that looks out on the garden, when I'm happy with a track I send it over to the studio and finish it off there.

What are the advantages/ disadvantages of using hardware & software ?

Well there are some pieces of hardware I still need like a mixer and speakers Guitars etc, and I suppose I still need myself which is probably considered hardware apart from the creative part of me. btw. It is very good to see a product like FL Studio which is available to all and doesn't cost $10000000000 of dollars.

We ARE still hoping it'll bring in that much one day though :)

Hope you make it.

9th Wonder

We believe **9th Wonder** (the producer and DJ of the band **Little Wonder**) did more for the acceptance of FL Studio in the hiphop market than any softsynth or instrument could ever do.

The moment 9th Wonder 'outed' himself as an FL Studio user the negativity around FL Studio on the hiphop boards disappeared and it became a cool tool.

Since then he worked together with **Jay-Z** on his 'Black Album'.

To start off, just for the record, how did you come up with the name Little Brother?

The name Little Brother was just, um, it just means, the artists we grew up listening to, you know, I'm saying the Tribe, De La, P.E., you know what I'm saying... they were like our big brothers in the game so now we are the little brothers of that movement. They were like our big brothers in the game, now they got a little brother following in their footsteps and carrying on the tradition of good music.

It says in your bio that the three of you met in 1998 while attending North Carolina Central University. How exactly did you guys discover that you all had that mutual passion for hip-hop?

Just from hanging out, you know what I'm saying? I met 9th (Wonder) in '98 and he was carrying a Source magazine, and so I asked to see it. We were just looking at it and saw that we liked a lot of the same cats so we just formed a bond from there. A couple of weeks later I met (Big) Pooh, you know what I'm saying, and I spit a rhyme that I had written earlier that day and he thought it was dope so we just hooked up from there. And basically, you know, just a friendship-type thing where we just shared a common interest.

Okay, well being relatively new to the scene, what do you feel Little Brother has to offer to modern-day hip-hop?

Um, I think the main thing we have to offer is just straight, no-frills music, you know what I'm saying? We are the exact same people that you hear about on record, that you hear on the album. We're the exact same people; you know what I'm saying? We're just trying to have fun, you know? We're just real down to earth so we try to put that in our music. We take our music, but we don't take ourselves seriously, you know what I'm saying? I think a lot of the problem with hip-hop is like, cats they really take it too seriously and don't really have no fun with it, so we just want to bring some fun back to the game.

Definitely, that's long overdue. How would you describe Little Brother's style to those who may never have heard of you?

Soulful. You know what I'm saying? Funky. And fun. Just those three words. A lot of 'underground' rap I think is just kinda soulish; you know what I'm saying? It's like there's a lot more style... well not necessarily style, but more technique over emotion, you know what I'm saying? A lot of mofo out there can rap, and can say dope shit, but you know, there's no real emotion behind it. So with us, we just wanna bring the soul back into it, you know? The meaning of the music. Having soulful music and soulful production, and also just soulful rhymes. You know, meaning you listen to our rhymes and you hear us as people, you know what I'm saying? It's like, 'Ok, I get it.' You walk away from the album with a better understanding of who Pooh and Phonte are as people. So that's how I would describe our sound.

Alright, so production-wise, I gotta say that 9th Wonder is absolutely incredible. I know he relies heavily on computers to create beats, but specifically, what equipment/programs does he use to produce?

The programs we use are Cool Edit Pro and FL Studio. Those are the two programs that we use, and that's what we did the whole album on.

Personally speaking, I think regardless of what you create beats on, it's the finished product that really matters, and The Listening's is absolutely incredible. But what do you have to say to people out there that are quick to criticize computer-generated beats?

Yeah... All beats are computer generated, man, you know what I'm saying? 9th had caught some slack from mofo who are like, 'Oh, he's on a computer,' you know. Man, all beats are computer-generated, nigga. Unless you playing every goddamn instrument by hand, and you know, playing bongos and shit, all beats are computer-generated. An MPC is just a computer in a box, you know what I'm saying? The SP1200 is just a computer in a box. It has a hard drive, it has memory, you know what I'm saying? So that's the thing. The only thing that matters is the end product. When I first met 9th and found out that he made beats on the computer, I was more amazed than anything. I was just like, 'I just wanna see how you do it.' And then I saw how he did it and I was like, 'Yo man, stick with what you do.' You know? As long as me and Pooh, as long as we believe in his beats then other cats can say whatever the f*** they wanna say.

Can we expect any videos from you guys?

Uh, I don't know. Honestly, we probably won't have any videos for this first record. I don't know, of course, that changes. As of right now, no.

Seismic Crew

How did you get involved in creating music ?

I've been involved with music from a very young age, singing in choirs since I was 5 years old, and playing piano since I was 8. When I was about 12 or 13, a friend of mine got a Kawai keyboard from his parents for Christmas. We fooled around with it a lot and had a great time writing silly little songs with the limited sequencer. That was the beginning of my insatiable gear-lust, which continues to this day !

Professionally, my first real success with music was in the late summer of 2001. I'd done a demo remix of a Craig David track with my partner Jeff Beck under the name 'Seismic Crew'. The import vinyl of that track had an a cappella on the B-side, which we used to do a trance-style remix of 'Fill Me In'.

Through contacts made at Promo Only where Jeff worked, we were able to get it into the hands of the VP of promotions at Atlantic Records. Though the record was old and the remix wasn't useable at the time, he was impressed enough to commission some more remixes for other Atlantic artists. And things snowballed from there. Oh, did they ever!

How did you end up using FL Studio ?

I used the demo of FL a lot back before I was making any real money with my music. I had been using the old software drum machine Hammerhead, but FL offered endlessly more flexibility and power. At the time, I was spending everything that I'd earned at my day job on keyboards and other pieces of noise-making hardware.

I was using FL to build drum tracks and loops one at a time, and then assembling them in (then) Sonic Foundry's Acid. After I sold my first remix, I bought a FL license. It is without question the best money I've ever spent on any music making tool ... software or otherwise!

What does FL Studio mean in your current setup ?

FL Studio is the core of all of my drum tracks. Everything that I program as a rhythmic element is programmed within FL Studio. I use it as a VSTi in Cubase SX, and the power of this combination is nearly limitless. One of the best things about it is that it has SO many layers. I can make a very basic drum track in a matter of minutes, or I can roll up my sleeves and really get dirty in the complexities of the routing and automation. The depth of the program is incredible. Automate

everything from anywhere at any time! What more could you want?

What are the advantages & disadvantages of using hard- & software ?

I currently have a love/hate relationship with hardware. On one hand, I love it because it sounds great, and there are certain pieces that currently have no software equivalent. On the other hand, it's a PAIN to use, as the MIDI timing can be sloppy, plus I have to record tracks one at a time, and the effects routing is limited to what's onboard the keyboard/module.

Software has no disadvantages. I have total recall of EVERYTHING, I can export tracks at greater than real-time, and I can mix with confidence knowing that what I'm hearing is what the final product will sound like. The only thing I have against software is that its performance is contingent on the hardware that runs it. However, with computer hardware falling in price and increasing in power exponentially, the future is looking very bright for computer-based musicians of all kinds.

Who did you work with so far ?

I've done a number of remixes in the last few years. Almost too many to count !

I've remixed for : Jennifer Lopez, Justin Timberlake, Mandy Moore, Michelle Branch, Willa Ford, Celine Dion, Craig David, Jewel, , Whitney Houston, Amanda Perez, Shawn Desman, Appleton, Warren Flandez, Off Limitz ... and the list goes on !

It's a crazy business where every deadline is/was 'f**king yesterday', and there's very little room for error. I don't sleep as much as I used to, but I've been loving every minute !

Mark Tinley

What does FL Studio mean in your current setup ?

It means I can create multi-track drum loops, music loops or even entire songs and dump them straight into Pro Tools for further mixing.

What are the advantages & disadvantages of using hard- & software ?

Analog verses Digital I guess, I can't see the point of using Digital hardware, except for maybe Pro Tools, or something really broken and old like a Casio SK1 which no-one will spend development money emulating. True analog stuff has a sound of its own and very few if any soft synths sound like the original units.

I am always impressed by these emulations first off. The VST Prophet 5 was a revelation till I compared it to the original unit. Okay, the layout is similar, but it doesn't sound the same. I like Fruity Loops as it is constantly evolving from ideas in the past, but with the future in mind, so there are several interesting twists in synthesis in there to play with from the off. Like the granular stuff and some of the plug-ins. They go a bit beyond emulation.

Who did you work with so far ?

Garden of Eden, Diskord Datkord, Jonny Slut, Adamski, Paris Working, Glenn Gregory, Gary Numan, The Stranglers, Duran Duran, The Dandy Warhols, ...

Meg Hentges

How did you get involved in creating music ?

My Grandfather was a fiddle player/bar owner in New York, so I grew up around live music. He gave me my first tape recorder. I started playing the electric guitar when I was 11 years old.

How did you end up using FL Studio ?

I started using FL a couple of years ago when I owned an analog 16 track studio. I had heard rumors about 'virtual drum machines', surfed around, and found FL by accident. When I downloaded the demo and started exploring, I was stunned by the creative possibilities.

What does FL Studio mean in your current setup ?

FL Studio (plus a wave editor) is the only software I ever use now. I've retired my hardware sampler and sequencer, and since FL added audio recording, my rack mounted hard disk recorder rarely gets switched on.

What are the advantages & disadvantages of using hard- & software ?

I hate computers, but I love software. I don't remember how I managed without instant recall of mixes, or without automation.

There are a couple of hardware boxes I'll never let go of (compressors and favorite sound modules) but it's a simple matter to integrate those pieces with FL Studio.

Peter (Skaven) Hajba

How did you get involved in creating music ?

The first music tracker on PC, Scream Tracker, did it for me back in 1989. I thought it was amazing that I finally had a program I could use to compose my own music and save it for later. Before this, I only owned a Casio CZ-101 and Casio SK-1 and settled for playing around with those. At that time, I had no idea about MIDI, mixing, effects or anything. I've picked it up, little by little, ever since.

Who did you work with so far ?

The Future Crew demos and intros were the beginning of my more 'public' career; before this I was just a hobbyist tracker musician. The only commercial album that contains my music is 'Opportunity' by Scope Records. I composed a song for 'Merregnon' (Alexa's Theme), but it was never released. I also made a music track for Unreal Tournament back in 1999. Recently I've made game music tracks for PopCap Games (see below).

How did you end up using FL Studio?

I thought I needed something good enough for professional work, that would be the logical next step from Buzz Tracker. FL Studio supported Buzz machines, and was very reasonably priced (lifetime free updates - how many developers give you that?). Bingo! I played with the demo version for a couple of months before I made up my mind. I already got very comfortable with FL Studio before I bought it. It was easy to learn.

What does FL Studio mean in your current setup ?

Professional grade music. Ironically, though, some of the music I currently produce - for PopCap's games - is not made with FL Studio. Shareware games and their music have severe file size limitations, so I have to use the ultra-compact MO3 format. I've used FL Studio to produce samples for my MO3 music though. Also, I'm working full time for Remedy Entertainment, a Finnish game developer, and I'm definitely going to explore the possibility of using FL Studio for game audio and music.

What are the advantages/ disadvantages of using hardware & software ?

I'm all for software. It's much easier to manage the projects as the virtual studio 'remembers' all the wirings and knob/slider positions. I never got very far messing with MIDI and SysEx

dumps. The only problem I've had with software is running out of CPU. Guess I'll just have to throw some cash at the problem. :) There was a huge "hardware boom" at the late 90s / early 00s, everyone rushed to buy their studios full of racks and keyboards. I somehow avoided all that, observing a friend of mine who did everything in software. Back then computers weren't yet powerful enough to manage very complex projects, so you basically had to own hardware if you wanted to go pro, but he was bleeding edge. No more. I'm amazed by two things: how versatile and powerful commercial plugins have become recently, and what an amazing array of plugins you can even find for free. Musical expression tools are really becoming within everyone's reach. And you can fit it all in your laptop. :)

DeadMau5

How did you get involved in creating music ?

I first got into the whole computer music scene back in '97 / 98... there really really a lot of options to explore when it came to making music with *just* computer music software. Of course, you had your mod trackers and all, but at the time, i couldn't help but to think that alot was still missing. So began my quest for better software, and it was around this time I met up with Adam Delaire of Cyberdyne Systems, a prolific DJ / MC as well as business owner based in Niagara Falls. Adam hosted a show on a local radio station (101.1 The Planet) at the time and to make a long story short, I essentially came on board as the all purpose 'whiz kid' to help out with the weekly production of the show.

Of course many years have passed since then and I have moved from endeavor to endeavor dealing mainly with audio freelancing for video games, media companies, software companies and licensing companies alike.

How did you end up using FL Studio ?

I actually stumbled across FL studio back in the super early days of the application... i believe it was through a random websearch, I grabbed a demo copy of Fruityloops 1.7 (perhaps even older than that?) and I've been hooked ever since.

What does FL Studio mean in your current setup ?

First and foremost, I launch FL with the beginning of each little idea I have in my head, whether it's a fast melody, or a drum groove to start out with... I Use FL Studio for that because I have found that the piano roll is by far the FASTEST way to 'plot' my melodies and rhythms down because although I have an ear for it, I couldn't 'play' a melody to save my life. So the base of the track is composed

almost entirely in FL Studio, all my piano roll / MIDI data is stored in FL Studio.

I export each element using FL's mixer down to their individual tracks using the 'export multiple tracks' option on. Each of these tracks are then coarsely dumped into each of their respective tracks... and I begin the actual 'mixing' process. I mainly use Nuendo for compatibility of course with all the studios I operate in and around... because their either Protools / Logic / or Nuendo themselves... so I like to keep my stuff portable so that im not getting stuck in a Studio that might not have FL.

Even when im in the Nuendo environment my FL usage doesn't stop there.. I load it up as a VSTi and begin building additional content for my current project... like, little funky breaks, maybe a new synth line when need be, but its always running in the background and ready for me to switch over when I need to sequence up and render out a break or phrase that wasn't rendered out the first time I did the big multichannel export.

FL Studio has, and probably will remain the main ingredient to my workflow. It's ease of use and fast results are what get the ideas down as fast as they come to my head, and that's really important for me. In the beginning of any of my productions, quality isn't at the forefront of my thoughts, its getting the ideas down, then refine.

One thing I love about FL studio that even the current 'top notch' applications I use DON'T HAVE, is the ability to rearrange your chain of effects on each mixer bus... I wanted to strangle nuendo a billion times for not having FL Studios 'move down / move up' option in the chain... especially when im experimenting. Experimentation is 80% of how a deadmau5 track springs up from the ground. I don't premeditate anything I do, you wont catch me humming along to some phrase when im walking home and itching to get on FL studio so I can draw it up... I just get in my little mental zone, and start blindly plotting away melodies with the 3xosc and a little effects here and there and see what I can come up with on the fly... and when it starts to work melodically for me, I build around it, and adding in other elements, like loading in NI's Reaktor as a VSTI into FL Studio and mangling parameters. A lot can be said by a 3xosc with a dissonant melody and the right insert effect.

What are the advantages & disadvantages of using hard- & software ?

I dont really have all that much knowledge in the hardware department to be bold enough to contribute to the age old 'hard vs. soft' debate... however, using software, i have found the flexibility, and modularity to prove to be a beautiful thing when it comes to bringing up old idea's and either re-working them or using them as templates for whole new songs. I would imagine using a mostly hardware solution, this could be quite the task as you may have X amount of synths with X amount of settings and patches and configurations that you would need to reconfigure each time you want to shift gears... and frankly i shift gears a lot, and I'd rather not be stuck in the studio patching gear all day thank you very much... Software to me has always proven to be virtually non destructible when it came to editing, instead of laying it all down to a few tracks on the DAT tape. I seriously doubt anyone still does it that way anyway.

Toby Emerson

How did you get involved in creating music ?

I started playing piano at a fairly young age but didn't really get into the music production side of things until I hit high school. I discovered how easy it was to create music using only a computer and a keyboard and everything just took off from there and went from just a fun hobby to an actual career.

Who did you work with so far ?

My biggest projects in the past year have come from Tycoon Records (MC Mario), Sony Music Canada, and Odeon Records. My remixes have been pressed to vinyl as well as landing on several CD compilations such as Trance Divas and Z103.5 Street Mix 2. I have already produced 2 full albums (one ambient, one electronic) that will be released in 2005 through Odeon Records. My own albums are the top 3 selling on the ampcast.com website and I hope to do a more official album soon!

How did you end up using FL Studio ?

I found the demo while searching on the Internet for a program that I could create drumloops with. I ended up getting a lot more than what I was looking for.

What does FL Studio mean in your current setup ?

FL Studio is my main tool and I'd say I use it for 95% of my work. I also have a Roland XP30 synthesizer and a big collection of VST instruments. All of my sequencing and arranging is done within FL Studio.

What are the advantages or disadvantages of using hardware & software ?

Hardware seems a little impractical as opposed to software to me. With software you have everything you need in one place so you can focus on the important thing of the actual music. The main problem I have with software is running out of processing power but as technology advances this problem should be taken care of. It seems that most hardware these days is being replaced with software counterparts.

Ripley+Jenson

How did you get involved in creating music ?

Each one of us started making music at the age of 12 or 13. We were enthralled by the typical eighties electronic sounds and in the end children's eyes made parents buy instruments.

How did you end up using FL Studio ?

Before we started working together, we were living in different cities and everyone of us had tried several software tools. But there was no tool that could cover everything we needed and wanted. One day my sister's boy friend asked me how to build Hiphop loops with a software called FL Studio. When I took a look at a FL demo version in order to understand it, I discovered that it was the software I always had been looking for. I told Jenson about the software and he was fascinated by it right away. Because of living 600 km away from each other, it was a radical change for us, since from then on we only had to send a simple FL Zip file back and forth.

What does FL Studio mean in your current setup

It has become our main tool. Every idea is recorded in FL, regardless of whether we are in the studio or in the garden with a notebook. Of course, we use hardware too (e.g. Korg M1, N5, Roland JV2080, various 303s etc.). The cool thing about FL is that you can easily combine everything: hardware, VSTi, audio files etc.

What are the advantages/ disadvantages of using hardware & software ?

Hardware may have MIDI timing problems at some points and software can be very demanding on your CPU. In the end, our setup took us everywhere we wanted. It's our personal mixture of both worlds. And FL has become a fantastic control center for it all.

Doug Lazy

How did you get involved in creating music ?

Started out as a DJ at age 13. This is what brought me to the point of wanting to produce.

From mixing I got into editing tape rhythmically. I actually edited my beats together in those days by taking a kick and snare and editing them in a pattern (samplers were not popular then). This is how I got into producing tracks.

The first sampler I did indeed buy was the Roland W-30. I went thru owning the following up to my current setup (FL Studio) : Akai S-1000 sampler (kb version), Emulator 3, MPC 60, MPC 3000, MC-505 ASR-X.

How did you end up using FL Studio ?

In 99 I moved to California for 10 months. During that time I was using a PC more often and stumbled across FL while surfing. I tried it and immediately loved it. I was still into hardware at the time but slowly over the last few years have transferred my work to PC exclusively with FLS.

What does FL Studio mean in your current setup ?

FLS is the MAIN part of my whole setup. It's *the* host now that it can record audio. I use various plug-ins from FLS and other companies, but FLS stays the heart of my setup.

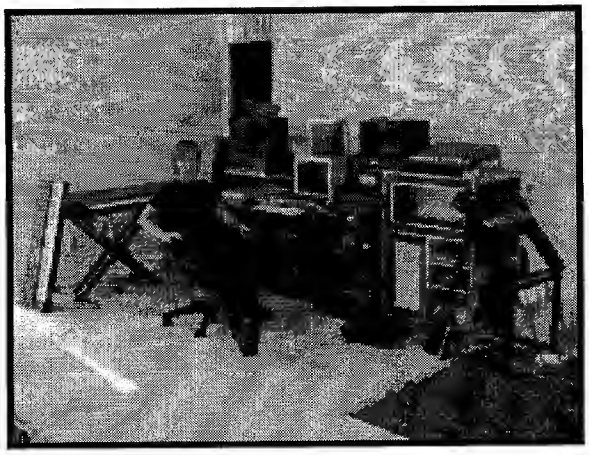
What are the advantages & disadvantages of using hard- & software ?

Me personally, I have come to the conclusion as of this year that there are NO disadvantages in my Software setup. NONE. Since I have used hardware for years as well as software I feel I can say this and know that it is a fact With the soft synths now and also samplers its nothing someone with hardware can do that I cant do. Hardware on the other hand is limited. Memory size of hardware cant even compete with my PC.

Who did you work with so far ?

Doug Lazy Getting Crazy which includes 3 #1 Billboard Dance singles (Let it roll , Let the rhythm pump, H.O.U.S.E), Mark Anthony, (Guest Rap), Aaliyah (Rock The Boat, Club Remix done with FL).

Steve Duda



How did you get involved in creating music ?

I was 'forced' to play violin as a kid, I was terrible at sight-reading (the co-ordination to play the instrument was enough work for me) so I started playing by ear, and learning the songs only by hearing them. This worked well until I started taking piano lessons, there is a lot more notes to hear in your head on piano :)

How did you end up using FL Studio ?

In 1998 I was having fun hacking Rebirth, putting new samples in the software with a resource editor. They got smart in the 1.5 Rebirth, allowing for you to create 'mods' with ease. However, around this same time I discovered Fruityloops. It allowed for drag-and-drop WAV with unlimited stepsequencer channels! This was my first attraction to FL, a simple stepsequencer/sample player where you could browse and replace samples with ease.

It was clear that the creator of the program had an eye for design and attention to detail. Fruityloops back then was a basic software drum machine, but the very best one that time. I'm very glad it has grown with the times.

What does FL Studio mean in your current setup ?

FL means a whole lot, if I were restricted to one item of music software on my PC, it would certainly be FL.

I use FL for software testing - it is quick to launch and debugger-friendly at this point (I've gotten into software development the last few years, with Devine-Machine, Fxpansion BFD, and recently Devine-Machine Lucifer VST, my first hand-coded effect plugin).

FL is not only the fastest program to start up, it's also the fastest environment to take a musical idea from your head to your speakers. There is so much ability, and so little limitation in FL that the main limitation is the users musical imagination.

I have a particular fondness for the FL FormulaController/Peak Controller, VSTi/VST FX hosting, ASIO multiple outputs, and the beloved FruitySlicer!

What are the advantages/ disadvantages of using hardware & software ?

This is a subject which is problematic because it compares two things which are so fundamentally different.

Analog hardware has qualities that can and will (theoretically) be reproduced digitally, however there is not enough performance (and DSP sophistication) to reproduce all of the subtitles - such as distortion non-linearities - of hardware in current computers..

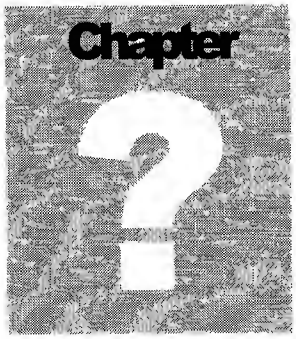
There's something to be said for tradition and nostalgia - Many 'classic' records of the 1980's and 1990's were made with hardware samplers, hardware synths, etc. These were the only tools available, and people would spend a lot of money on studio time just to have access to the gear. Due to the limitations of the gear, people would make the best of what they had, which brings me to another important point.

Hardware tends to have a bit more care and thought put in to parameter ranges and such. Its tough to generalize because a lot of students can make a VSTi synthesizer, where a hardware one takes money and most often some professional design.

The limitations found in hardware force people to use their ears and choose from a limited number of choices. Sometimes audio software provides too many choices. This is because the computer programmers are too close to the theory, they don't see any reason to make their compressor/delay/EQ/etc have restrictions. If a Linn LM-1 drum machine had 1000 kick drum and snare samples to choose from instead of one, would those Prince songs sound as good? Instead of spending an hour trying 100 kick drums, you have to do what you can with the one you have (perhaps adjust tone and decay) and get back to making a song instead of 'tweaking out' FL Studio loop ...

Who (& which albums) did you work with so far ? Any pics ?

I've worked on a lot of records in many different ways. My most common gigs have been programming and editing, but I get a lot of mixing and keyboard gigs as well. I work with & for : Nine inch nails, Rob Zombie, Methods of Mayhem, Pitchshifter, A Perfect Circle, ...



'When ideas fail, words come in very handy.'
Johann Wolfgang von Goethe.

Famous Last Words

We get the strangest emails and letters and decided to gather them together in a single place a couple of years ago, if it weren't for the fact this book is already too big we would have put in a lot more, however space is tight, so we include here just a small selection. Please note that a lot of these seem to be written by people for whom English is not only a second (perhaps third?) language, some of them must have been pretty heavily influenced by chemical substances at the time they wrote these emails. Enjoy ☺

'Im begging you please!! I had a beat going and i was online while using fruityloops and my comuter froze and the beat dissapeared!! I was so angry, it was my best work. I have a WAV clip of the beat i made.Im begging you, if i send you the WAV can you send me back the same thing in fruity loops file? becuase i dont remember how to make it again! Please!?!?!?'

'Hey !! I' m usser Fruity Loops in Poland and i have questions ... How obtain efect hard kick, the same as profesjonal german comercial music TRANCE. Yours module (fruity kick) not give possibility hard,trance kick. So how it make? Pleasse short answer on my questions. thank you !!!!'

'DO YOU REALLY THINK didlier dambrin WROTE FRUITY LOOPS? I DOUBT IT.NO SOFTWARE WRITER TALKS LIKE him. Call him to task.Have him talk shop.Have him compose a song with FRUITY LOOPS.. didlier SHOW YOURSELF ! THANK YOU.'

'Dear fl team,

We're the probablu most 'ball-breakers' u have evere seen... just for refresh your memory, we're XYZ, an hiphop group. We dream to be sponsorized by you.. not for money, just for the chance to said 'hey, guys, we're sponsorized by fruityloops, f*** Reason and same shit!' We don't have much money and probably you boys too.. we're happy just with your autorization and some T-shirt... or a wheels-of-steel cover!

Because you may think 'this is just an idiot with a 'no-good-english' we send to you a little piece of our last song on mp3. If u wanna do something with it or anything else, CONTACT US!!!

Thank u and sorry for all.. waiting a signal from FL team

XYZ from Italy (NOT just berlusconi, pizza&f***in' maphia!)'

'Hey im e-mailing you about the beat I herd from FL studios. I would like to have a tutaroil if thats ok. and when I noticed when playing around I got a good beging going but it takes ub all the tables and after the beging part I need there to be drums so lets say its full alien efect then after that I want to add a laser eefect but its full I just want to know is there a better program or is there a way to add more tables?'

'Hello, I was in the help area of the fruity loops express section of the guitar tracks pro software that I purchased. I was shocked to see in the ts-404 guide that an f work was included.

I want some sort of renumeration for this , I dont want to go into the software anymore, also a bass audio has an a word in the title.

Would you please provide some sort of replacement for this product for me to use?'

'Dear FL,

I am a member of the Apostrophe Protection Society, and it has come to my notice that an apostrophe has, unfortunately, been neglected by your website. You obviously don't have any feelings for this poor, helpless little soul, and I would like very much for you to apologise to it and take it off your web page.

When I clicked on your 'Downloads' section, I was horrified to see a box at the top of the page titled 'Software Demo's.' However, in this case it should be titled 'Software Demos.' This is an example of total disregard to the fact that apostrophes DO have feelings, and moreover, hate to be in situations they really shouldn't be in.

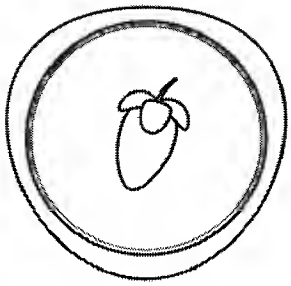
I hope to see this matter resolved in a matter of urgency, and in all seriousness, for this mistake never to occur again.'

'You can construct a synth in Synth Edit.You can render it as a dll in Synth Edit.When you use the synth as a VST in FL Studio it does not respond the same.Try it.Download Synth Edit.Render their synth and put it in FL Studio as a VST.It seems to me that there is a virus attacking the GUI.FL Studio sits in the memory and runs.{only serious replys} THANK YOU. If a VCR is an analog machine a computer is a DC machine.A VCR will have scope test points on the circuit board where the computer will not.There are no test points on a computer's motherboard.The computer is a memory device.The computer uses memory chips in its function.Carbon{pencil lead-resistors} is a CONDUCTOR material;silicone{beach sand-glass} is an INSULATOR material.Carbon and silicone mixed together is a SEMICONDUCTOR material.The metal leg in the memory chip sets up a zone of inductance or capacitance in the semiconductor material.CMOS{complimentary metal oxide semiconductor}says that there is metal oxide in the memory chip.You would find metal oxide in audio or video recording tape.In audio recording the actual audio wave is magnetically imparted or recorded to the tape.The tape is magnetized with this audio wave form information.In this experiment I have a multi voltage AC/DC power supply and a scope.On the scope we see that the power supply is generating ten voltages.One to ten volts DC.{with a zero voltage being greater than a minus voltage}I switch off several of the voltages at the power supply and I see that ten volts does not disappear.If I set the power supply to AC and I removed some volts I would see that the resultant wave has diminished.AC fills in the whole bar and DC is a line.I now have a DC tape recorder and my supply.While I am recording I switch off voltages.At playback I see what I have done has been faithfully recorded.I can even switch off voltages at playback and observe that ten volts is unaltered.A memory chip works the same way.A voltage is recorded in to the metal oxide and that recorded blip would be a zero or a one.Many voltages would make the memory chip bigger in bytes.ROM{read only memory}chips never are erased.The file is recorded and it remains there forever.RAM{random access memory}chips could have a refresh voltage that erases the file in them.I tell the CPU with the mouse click that I want to move a program from the hard drive to the memory and the computer starts my program.When I close the program the memory is cleared.The difference in memory chips{ram-rom} is the voltage they are run at.The RAM will erase really fast!The ROM will not erase unless its erase voltage is achieved.BIOS flashing is an example of erasing a chip then recording a new file in to the chip.The BIOS chip is a memory chip with a file recorded in it.There are some custom adjustments that you can make in the BIOS chip and they are held there by the BIOS battery.The BIOS battery also powers the computer's clock.If you were to remove this battery the BIOS settings would be lost{password etc.}and the clock would have to be reset.Memory chips run on DC transistors do not.If the CPU were a memory chip then you could record a new file in to it.The memory address point or blip in the memory chip is scanned or strobed at a certain frequency.200 MHz is a car tire spinning 200 million times in one second.Seems fast enough to me.My friend and I go to the electronics store and purchase a HAM radio.We move in next door to the channel 12 transmitter tower.We climb the tower and attach our HAM radio antenna to the channel 12 tower.We're talking to Baghdad!And in the basement we have an ISP computer.The Internet is %99.99 the telephone companies of the Earth.The Internet dial up telephone numbers are Federal numbers just like the broadcast frequencies are Federally assigned frequencies.News wire services use a system similar to the Internet.To be an ISP one must have a contract with the telephone company.If the ISP were to charge money for its use the Federal

government would charge the telephone company and the telephone company would charge the ISP.Satellite,land etc.use.It would be in the neighborhood of a trillion dollars a minute. The telephone company uses 24 volts DC.12 volts plus and 12 volts minus.{adds to zero--it is'node like'}Draw two lines 12 plus -- 12 minus.Now draw a sine wave there.Not even close!You could never put a sine wave on the telephone company line.The telephone's carbon transducer is an active switch.It pulses the DC.It is digital at some electron related frequency.With a pencil put a small dot on a piece of paper.Zoom in to one carbon atom--now in to one electron orbiting the nucleus of that carbon atom.The electron has traveled 186,281 miles in one second around the nucleus of that carbon atom!Frequency is hardly a worry.The Internet is computer digital,pulses of DC,on the telephone line.When you click a link address on a web page you are routed to that sight by the telephone company's switching system.The Internet is a network of computers that use the telephone company as a router.{They never could plug in an LSI chip.}'

You guy's gave me the username A*****J*******7226662 how ever it has 666 in it which is said to be the sign of the Devil so I was asking if there a way that can be change.

WHAT???



Keyboard Shortcuts

File operations

Open File	Ctrl + O
Save File	Ctrl + S
Save New Version	Ctrl + N
Save As...	Ctrl + Shift + S
Export Wave File	Ctrl + R
Export MP3 File	Ctrl + Shift + R
Export MIDI File	Ctrl + Shift + M
Open Recent Files 0..9	Alt + 0, 1..9
(Re)arrange Windows	Ctrl + Shift + H

Step Sequencer

(Un)mute First 10 Channels	1...9, 0
(Un)Solo First 10 Channels	Ctrl + 1..9,0
Select Prev/Next Channel	↑ / ↓
Delete Selected Channel(s)	Ctrl + Del
Group Selected Channels	Alt + G
Zip Selected Channel(s)	Alt + Z
Unzip Selected Channel(s)	Alt + U
Move Channel(s) Up/Down	Alt + ↑ / ↓
Next/Prev Channel Group	Page Up/Down
Cut Channel Steps/Score	Ctrl + X
Copy Channel Steps/Score	Ctrl + C
Paste Channel Steps/Score	Ctrl + V
Clone Channel(s)	Ctrl + Shift + C
Shift Steps Left	Shift + ←
Shift Steps Right	Shift + →
Randomize	Alt + R
Send to Piano Roll	Alt + P
Show keyboard/graph Editor	K/G

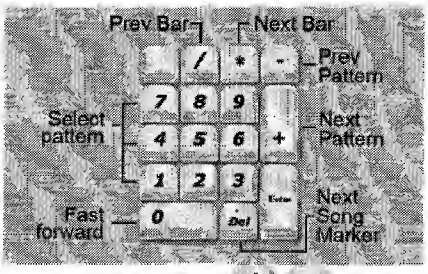
Window Navigation

Cycle Nested Windows	TAB
Toggle/Max/Min Playlist	Enter
Close a Window	ESC
Help	F1
Toggle Playlist	F5
Toggle Step Sequencer	F6
Toggle Piano Roll	F7
Toggle Sample Browser	F8
Toggle Mixer	F9
Toggle MIDI Settings	F10
Toggle Song Info	F11
Close All Windows	F12

Sample Browser (FL Studio 8)

Reread Structure	Ctrl + R
Collapse structure	Ctrl + ↑
Smartfind	Ctrl + F
Find	Alt + F
Find Previous/Next	F2 / F3

Pattern Selector & Num Pad



Next/Prev Pattern	← / →
Next Empty Pattern	F4

Record/Playback/Transport

Toggle Line/None Snap	Back Space
Start/Stop Playback	Space
Pattern/Song Mode	L
Switch On/Off Recording	R
Toggle Step Edit Mode	Ctrl + E
Stop Sound (Panic)	Ctrl + H
Toggle Blend Notes	Ctrl + B
Toggle Metronome	Ctrl + M
Toggle Wait for Input	Ctrl + I

Playlist

Insert/Delete Pattern	Ctrl + Shift +Ins/Del
Move pattern Up/Down	Alt + ↑ / ↓
Grid Color	Alt + G
Color Selected	Alt + C
open pattern in browser	Alt + P
Quick Quantize	Ctrl + Q
Select All	Ctrl + A
Center playing position	0 (zero)

PC Keyboard to piano keys Ctrl + T

When the PC Keyboard to Piano Keys (CTRL+T) is 'on' you have to use Shift to use the keys that the keyboard covers (so G becomes Shift + G)

Pianoroll

Operating modes	P,B,D,C,E,Z,Y,S
Zoom time	Page up / down
Import MIDI file	Ctrl + M
Keyboard mode	M
Select All/Next	Ctrl +A / ➔
Insert/Delete Space	Ctrl +Ins/Del
Change Color	Ctrl + C
Insert Controller Value	Ctrl + I
Quick legato	Ctrl + L
Articulate	Alt + L
Quick Quantize	Ctrl + Q
Quantize	Alt + Q
Quick Chop	Ctrl + U
Chop	Alt + U
Arpeggiate	Alt + A
Strum	Alt + S
Flam	Alt + F
Limit	Alt + K
Flip	Alt + Y
Randomize	Alt + R
Scale levels	Alt + X
LFO	Alt + O
Grid Color	Alt + G
View note helpers	Alt + B
Ghost channels	Alt + V
Zoom Far/Close/Medium...	1/2/3/4/5
Note Filter resonance	Q
Scale group of notes by ratio	Shift +Resize

MUST HAVE

You can buy a range of FL Studio merchandizing at **www.flstudio.com/merchandising** there you will find cool stuff like posters, caps, bags, thongs, mugs etc...well it's cool once the FL logo is on it!

GLOSSARY

- A -

A-WEIGHTING A standard compensation (adjustment) curve sometimes applied to audio measurements to account for the ear's response to low-level sound. The human ear is most sensitive to sounds in the 2,000-3,000 Hz range and least sensitive to those below 20-30 Hz and above 16,000 Hz. Frequently applied to measurements of the residual noise levels of wireless microphone systems and other electronic devices. ('A-weighted noise.')

ACCENT Stress/additional loudness given to a musical tone.

ACCIDENTALS In music, these are sharps, flats, or naturals that are not indicated in the key signature. If you are a poor keyboard player they are the notes you didn't mean to hit ☺

ACTIVE MONITOR A speaker designed for mixing music with built-in amplification (that's the 'active' part). The design philosophy is to achieve a flat output frequency response for a flat input frequency spectrum. That is, not to change the tone of the input sound in order to allow the person mixing to hear accurately their deliberate changes to the mix. See also page 10. See also ***Passive Monitor***.

A/D CONVERTER The chip/system that converts an analog signal (tape, radio, LP, microphone etc) into a digital signal (CD, DCC, DAT, hard disk, WAV). See also ***D/A Converter***.

ADDITIVE SYNTHESIS The process of constructing a complex sound using a series of fundamental frequencies (pure tones or sine waves). Each of the fundamental frequencies usually has a unique amplitude envelope that allows independent control of each partial (harmonic). Pipe organs or Hammond organs are both instruments which are based on additive synthesis. If you want to try this form of synthesis, construct sounds using only the Harmonic Editor in Sytrus (page 153).

ADSR Abbreviation for **A**ttack, **D**ecay, **S**ustain, and **R**elease - the four parameters found on a basic synthesizer envelope generator (some have more stages). The Attack, Decay, and Release parameters are rate or time controls. Sustain is a volume level. When a key is pressed, the envelope generator will begin to rise to its full level at the rate set by the attack parameter. Upon reaching peak level it will begin to fall at the rate set by the decay parameter to the level set by the sustain control. The envelope will remain at the sustain level as long as the key is held down. Whenever a key is released, it will return to zero at the rate set by the release parameter.

AFTER TOUCH Pressure applied to a synthesizer keyboard after the key is depressed. In FL Studio this can be linked to control a filter for example that opens up as you press harder. Note that Aftertouch is not a common feature on cheaper controller keyboards so don't go asking on ***LoopTalk*** how to link Aftertouch to some controller before you make sure your keyboard has it.

ALGORITHM One or more mathematical formulae aimed at performing some procedure. Eg. Reverb algorithm.

ALIASING Unwanted frequencies produced when a sound is sampled at a rate less than twice that of the highest frequency in the sound. These unwanted frequencies are typically high pitched whistling/harmonics correlated with the recorded sound. Oversampling can eliminate this problem and appears in various places throughout FL Studio. See also ***Quantizing Error***.

AMPLIFIER A device that increases the magnitude of a voltage or current without distorting the wave form of the signal. An amplifier takes a weak signal from a line level or mic level source and provides the necessary power level to operate loudspeakers.

AMPLITUDE The term used to describe the magnitude of a signal. It can relate to volume in an audio signal or the voltage level of an electrical signal.

AMPLITUDE MODULATION A forced change in the level of a signal. E.g. if a Voltage Controlled Amplifier (VCA) were being modulated by a Low Frequency Oscillator (LFO), the result would be a periodic increase and decrease in the volume level of the sound. In music, this would be referred to as 'Tremolo'. The abbreviation of Amplitude Modulation is AM.

ANALOG A continuous signal. This usually describes anything physical in nature such as sound, electrical currents (i.e amplifier output). All human senses require analog inputs, no matter how cool your MP3 player, the last stage must be an analog output.

ANALOG SYNTHESIZER A synthesizer which uses voltage-controlled analog modules to create sound. The concept of a variety of analog modules all of which can interconnect via a standardized voltage control system was invented by Dr. Robert Moog. The three main voltage controlled modules in an analog synthesizer are: Voltage Controlled Oscillator (VCO), Voltage Controlled Filter (VCF), and Voltage Controlled Amplifier (VCA).

ANECHOIC CHAMBER An acoustic space without echo or reverberation. Often used for the acoustic testing of microphones and loudspeakers where room interference is undesirable. Anechoic chambers are also a great place to leave children.

APERIODIC WAVEFORM A waveform that does not have a repeating pattern.

ARPEGGIATOR A device or computer program that plays notes in a repeated pattern. The speed and pattern are variable. FL Studio has an arpeggiator tool built into the **Piano roll see page 54** and a real-time arpeggiator in the **Channel wrapper, see page 81.**

ARTICULATION The percentage of a note's duration that is sounded. This is the difference between a staccato and a legato playing style.

ASIO Audio Stream Input/Output. This is an advanced 'driver' program that allows the soundcard and host computer to communicate. ASIO is particularly cool as it bypasses most of the Windows OS and so is not encumbered with the usual Microsoft stupidity, and so, runs spectacularly fast. The high efficiency processing of audio is necessary for real-time audio recording in FL Studio. In other words, you need ASIO to record live audio inputs into a running project. There is a 3rd party work-around www.asio4all.com that may help if your soundcard does not natively support ASIO. Please be aware that you use this ASIO driver at your own risk.

ATTACK The first parameter of an envelope generator which determines the rate or time taken to reach the highest level (often volume) before starting to decay.

ATTENUATED Reduced in volume.

ATTENUATOR A device that reduces the value of something, usually the amplitude of a signal (I.e. Volume control).

AUDIBLE RANGE (AUDIBLE SPECTRUM) The range of frequencies that the human ear can hear. A healthy young human can usually hear from 20 cycles per second to around 20,000 cycles per second (20-20,000 Hz), less after prolonged exposure to Heavy Metal music, Opera or a nagging partner.

AUDIO Sound, its transmission and reproduction.

AUTOMATION CLIP A special file that contains a sequence of instructions for FL Studio to automatically move a knob or slider somewhere inside the program. Automation clips are placed in the lower part of the Playlist and can be used for example to open and close filters in synthesizers, perform Mixer fades and pans etc. You cannot record live tweaks into an Automation clip. See pages 235, 241. See also ***Automation Event.***

AUTOMATION EVENT Automation data that is stored within pattern blocks. This data may be recorded live from knob tweaks or manually drawn using the Event editor, see pages 241, 250. Automation events are placed into the upper, pattern block, area of the Playlist.

AUTOTUNE The process of taking an audio input and forcing it to play back at pre-defined pitch. Autotune FX is why modern pop stars are selected on the basis of looks alone, singing can be 'autotuned' later.

- B -

BAND PASS FILTER A filter which allows only a selected band of frequencies to pass through while rejecting all other frequencies above and below the cutoff points. Usually a band pass filter will allow the user to set the width of the pass band.

BANK The sound-set associated within an instrument. The Bank contains all preset, sample data, and sequence data.

BARGRAPH A display indicating a value, usually by means of a row of LEDs, LCDs or screen segments. One or more LEDs or LCD segments illuminate to display the present value of the function being metered in relationship to the maximum value. These have replaced fragile and expensive mechanical meters for most purposes in audio equipment. See also ***VU Meter***.

BELGIUM The home of the world's finest beers, chocolate and FL Studio.

BINARY A form of numbering system where the only digits used are 0 and 1. It is the system used in all digital electronics.

BIT is an abbreviation for 'binary digit', which is the basic unit of information used in a digital system. 16-bit and 24-bit are two popular formats for audio files. This means 16 and 24 bit binary numbers are used to represent the signal amplitude (quantization). 16-bit has 65,536 steps and 24-bit has 16,777,216 steps, don't even ask about 32-bit ☺

BOUNCE When recording or sequencing, to bounce tracks means to combine (mix) several tracks together and record them on another track, see page 243.

BOUNDARY MIC A type of microphone that detects sound pressure level changes at a boundary of the acoustic space in order to reduce interference between direct and reflected sound.

BREATHING An audible change in the level of background noise with varying audio levels. Most often used to describe an undesirable characteristic of compressors and expanders. A faster, somewhat more noticeable form is called ***Pumping.***

BUFFER An area of computer memory or other microprocessor-based device, e.g. synths, used to temporarily store data. You can control the main audio buffer size in FL Studio for optimum performance, see page 266. Further, plugins by default, communicate with FL Studio through a 'fixed sized buffer', which can be changed to a variable sized buffer, see page 72.

BYTE Digital systems normally operate on 8 bits of data at a time, and a group of eight bits is a byte. File sizes tend to be measured in Kilobytes (1000's of bytes)...1 Kb turns out to be 1042 bytes actually (2^10)...don't ask.

- C -

CARDIOID Describes a specific receptive field shape of a directional microphone. This 'heart shaped', narrow pattern, picks up sound most effectively from directly in front of the mic. Very useful for recording drums.

CATALOG A list of all files stored on a disk or in a bank. Sometimes called a directory.

CENT Unit of pitch equal to $1/100^{th}$ of a semitone. FL Knobs will pause briefly every 100 cents while tweaking (press SHIFT to avoid this behavior).

CENTER DETENT A notch in the center of a modulation wheel or lever which allows the user to find the center or starting position. Many FL Studio knobs behave this way, pausing momentarily at important positions. This can be overridden by holding down the SHIFT key while moving the knob.

CHAIN CONNECTION See '***THRU***'.

CHANNEL In ordinary language, a channel is a path for passing data. In MIDI, channels are used to separate different sections of a song that are going to play together. Each channel is assigned to a single instrument in any particular instant of time. One channel is usually reserved for a percussion voice. To channelize means to move to another channel.

CHANNEL, MIDI CONTROL A MIDI Channel also contains information about which controllers are being varied.

CHANNEL, OUTPUT The circuitry through which an instrument outputs individual notes.

CHANNEL MESSAGES MIDI messages that carry a channel number in the header byte, which can be directed to one instrument, or one voice of an instrument. These messages include note on, note off, and program change instructions. Messages that do not contain a channel number are called 'system messages'.

CHORD Three or more tones sounded simultaneously, preferably harmoniously. The Piano roll has a method for automatically creating chords, see page 44.

CHORUS A voice doubling effect created by layering two identical sounds with a small delay (20-50 ms) and slight modulation of the frequency of one or both of the sounds, see page 200.

CIRCULAR PANNING Moving the position of a sound in the stereo field while avoiding changes in perceived loudness. See also ***Panning*** and ***Triangular Panning***.

CLEF The sign at the beginning of a musical staff, that determines pitch.

CLIPPING In audio equipment, severe distortion caused by a signal whose peak level exceeds the capabilities of the device processing the signal. Clipping results in flattened signal peaks, that look as if they have been 'clipped' off. See page 181.

CLOCK See also ***PPQ***. A steady pulse from a generator used for synchronizing sequencers, drum machines, etc. Common sequencer timing clock rates are 24, 48, or 96 pulses per quarter note. The default PPQ in FL Studio is 96. PPQ is user selectable, see page 271.

CLOSE MIC Placing a microphone close to the sound source in order to pick up mainly direct sound rejecting most of the reverberant sound.

CODEC Abbreviation for compressor/decompressor. This is a small program that converts a file to and from a compressed (space saving) state. Mpeg Layer 3 (MP3) is a popular audio CODEC. Keep an eye on Microsoft Media Player, it won't be long before you see a 'pop up' message – 'Downloading CODEC'.

COMPRESSION Reduces the dynamic range of a song or sound. Compression makes the loud parts sound softer, and the soft parts louder. A 'must use' FX for drum and bass parts. See page 201.

CONDENSER MIC A microphone in which the sound-capturing apparatus consists of an extremely thin electrically conducting membrane (electrically charged), suspended very close to a plate/mesh of the opposite charge. This arrangement converts sound waves into variations in 'capacitance' and a circuit in the mic converts this into an electrical voltage. Condenser microphones are very sensitive and usually have greater frequency response when compared to a ***Dynamic Microphones,*** the condensers diaphragm is thinner and lighter so can respond to weaker signals. Large diaphragm condenser mics are the standard tool for studio vocal recording. You don't see them on used stage as they are too delicate and vocalists too clumsy.

CONSOLE A large audio mixer with several input and output channels. Also known as a board.

CONTINUOUS DATA Control data such as ***pitch bend*** and ***aftertouch***.

CONTOUR See Envelope Generator

CONTROLLER A (MIDI/USB) controller is any device that transmits note/knob/MIDI data, and which can therefore control other equipment. Originally MIDI controllers were keyboards, but these days there are computer-based controllers, foot pedals, guitar controllers, and various other types. You do not have to be a keyboard player in order to exploit the power of MIDI.

CONTROLLER CHANGE An event to change a synthesizer setting.

COUNT IN A command in a sequencer that plays a metronome for several measures until you are ready to record. See page 30.

CPU Abbreviation for Central Processing Unit. This is the main chip in the computer that processes data and on which the operating system (Windows) runs. Pentium (Intel) and Athlon (AMD) are two CPU brands that run FL Studio.

CRESCENDO A gradual increase in volume. Antonym of Decrescendo. Use ***Automation Clips*** to achieve these effects.

CROSSFADE To fade out one sound while fading in another so that a seamless transition is made between the two. There is a macro in the Audio Clip drop down menu to speed up the creation of crossfades.

CUTOFF FREQUENCY The frequency above which a low pass filter will start attenuating signals presented at its input. Abbreviated Fc.

- D -

D/A CONVERTER (DAC) A device which takes digital data and converts it to an Analog output. All digital musical instruments, soundcards etc must have a DAC so that we can hear their output.

DAMPER Traditionally, the damper pedal of an acoustical piano functioned to stop vibration of a piano string. (In contrast, the SUSTAIN pedal held or prolonged the note.) Unfortunately, sustain pedals on electronic pianos are often called 'damper' pedals, thus blurring the distinction.

DATA Information stored in a computer so that it can carry out a particular action.

dB(Declbel) A psychologically tricky scale, deliberately designed to confuse musicians as it is not linear, or logical. It is a unit used for measuring two voltages (which is why it appears as a unit of measurement on audio gear) or sound pressure levels. 0 dB does not mean no voltage or sound (although it is close to the human limit of hearing), it means a sound level where the sound pressure is equal to that of the reference level. This system allows minus dB values. A 1 dB increase is close to the just noticeable change while a 10 dB increase is often perceived as a doubling in apparent volume.

DB/OCTAVE The unit typically used to indicate the slope of a filter, or how fast the amplitude declines past the cutoff frequency. Example: A 24 dB/octave filter would attenuate an input signal by 24 dB one octave above the cutoff frequency, and by 48 dB two octaves above the cutoff frequency, and so on.

DECAY The second stage in an ADSR type envelope generator. OR - The process of diminishing.

DEFAULT SETTING The starting state of a program when the user does not specify an alternative state.

DELAY A controllable time parameter giving the ability to start an event only after a predetermined amount of time. Typical places too see a delay are in the 'delay' FX and envelopes.

DEPTH The amount of modulation. Sometimes called Amount, Width, Intensity or Modulation Index.

DIDIER DAMBRIN See ***GOL***.

DIGITAL Data is represented in binary numbers, 1's and 0's. In a digital synthesizer every aspect of the sound generation is handled as a numeric calculation. The digital information is not audible and so must be converted to analog form by a DAC before it is output.

DIN CONNECTOR This is the standard type of plug/socket used for MIDI interconnections. Note that it is no good trying to buy just any DIN connector, as there are numerous types. The variety used for MIDI interconnections is the 5 way 180 degree type. A din connector may be seen on page 264 in the audio settings window.

DISTANT MIKING A microphone placement technique which involves placing a microphone far from the sound source in order to pick up a high proportion of reverberant sound.

DITHER A small amount of noise added to a digital recording to make ***Quantizing Errors*** less apparent.

DOWNBEAT The conductors downward stroke, indicating the first beat of a measure. In contrast, the upbeat is unaccented. Alternatively: how you feel after having your demo CD rejected by the A&R guy.

DRIVER A driver is software that works to manage communication between the Windows Operating System and a peripheral, such as a sound-card or video card. See also ***ASIO***.

DSP Digital Signal Processing. The term given to the processing of continuous input data (such as audio) or the processing of mathematical formula to output continuous audio signals (as in software synthesis). Before PCs became 'so' fast, DSP chips were popular, because they implemented in hardware, complex processing instructions and could perform DSP in real-time. Today we take DSP for granted and expect our PCs to perform DSP at the same time we are surfing the net and buying crap on e-bay.

DUBBING Making a new recording of sound already recorded. Sometimes used to describe the process of mixing sounds from several sources into one recording.

DURATION The length of time (number of beats) of a note or chord.

DUVEL Fine Belgian beer.

DYNAMIC MIC A microphone where the sound capturing diaphragm moves a coil suspended in a magnetic field in order to generate an output voltage proportional to the sound pressure level. This is the same principle as used in speakers, although in reverse. As the diaphragm has a very fine coil of wire attached to it there is more mass to move than in a ***Condenser Mic***, this generally means less sensitivity. Dynamic mics are the choice for stage work as they are robust and can stand to be knocked about by musicians who care more about how their hair looks than about technology, "Is this thing on?" WHACK WHACK...BOOM BOOM "Testing 1, 2...does anyone here have a hair-dryer?".

DYNAMIC RANGE The range of the softest to the loudest sound that can be produced by an instrument. Or the range of the low and high signal levels obtainable by a velocity sensitive keyboard. The greater the Dynamic Range, the more sensitive the keyboard.

DYNAMICS Variation in the intensity of musical notes.

- E -

EDIT Editing, in MIDI, involves altering, deleting, revising the musical passages that have been captured in a digital recording, and are now displayed on the monitor screen. This display will offer two options: (1) The notes are listed by track and number, by event (like 'Note on'), by the specific note G4, the beat, the channel, etc. (2) The second option for editing is to use a musical notation display. Here, the notes are arrayed in clefs, (a) like a piano-roll. or (b) in conventional musical notations. Editing options include changes in notes, measures, transpose, volume. (The piano-roll display is sometimes referred to as 'graphic notation.')

EFFECTS, see FX.

ELASTIQUE The brand name of the non real-time time-stretching algorithm (licensed from Zplane) used in FL Studio, see page 90. See also ***Pitch Shifting***.

ENABLE – DISABLE Turn on - turn off. Synthesizers and sequencers have many controls requiring such action.

ENVELOPE The changes of a tone, e.g., attack, sustain, decay, release, See ***ADSR***.

ENVELOPE GENERATOR A circuit, usually triggered by pressing a key on a keyboard, that generates a changing voltage with respect to time. This voltage typically controls a VCF or VCA. An AHDSR and ADSR are two types of Envelope Generators.

EQUAL TEMPERAMENT A Scaling system where the octave is divided into 12 equal parts. The ratio of the frequencies between any two adjacent notes is exactly the same. Most keyboard instruments are scaled in this manner. The EIII is normally tuned with Equal Temperament, but can be tuned to other relationships by the use of the tuning function in the Analog Processing Module.

EQUALIZATION (EQ) The selective adjustment of volume at a specific frequency. Bass and Treble controls are a basic form of EQ.

EQUALIZER A device which allows attenuation or emphasis of selected frequencies in the audio spectrum. Equalizers usually contain many bands to allow the user a fine degree of frequency control over the sound. Graphic EQ and Parametric EQ are two common designs of Equalizers.

EVENT In ordinary language, an occurrence, a happening. In MIDI, the signal that is transmitted, like note on, note off, program change, control change.

EVENT CHASING Scans data in a sequence before the start-point of the recording. Looks for patch changes, for example.

EVENT LIST An alphanumeric display of all MIDI events on a single track. Examples: notes, time signature, tempo, program changes, control changes.

EXPANDER A circuit or program to perform dynamic range expansion of an audio signal, usually in a logarithmic manner.

- F -

FADERS Controls for changing effects gradually, like decreasing loudness.

FAST FOURIER TRANSFORM A computer algorithm which derives the Fourier spectrum from a sound file. The Fourier spectrum is a set of sine waves of specific amplitudes...wait...forget it...go look it up on Google!

FEEDBACK In acoustics, the undesirable leakage of audio from loudspeakers back into a microphone, resulting in a loud squeal or howling sound, or in less severe cases, a hollow ringing sound quality or whistles. It's also possible to create feedback loops if you pass the output from an amplifier or signal processor back into the input.

FILE TYPES A MIDI File Type 0 is a single (multiple-channel) track. A MIDI File Type 1 contains one or more simultaneous tracks.

FILTER (1) The noun and the verb, in MIDI, are used primarily in connection with events (note on, program change, tempo change.) and with channel changes. Each event is either filtered (deleted), transformed, or passed through.

FILTER (2) A device used to remove unwanted frequencies from an audio signal thus altering its harmonic structure. Low Pass filters are the most common type of filter found on music synthesizers. They only allow frequencies below the cutoff frequency to pass (Low Pass). High Pass filters only allow the high frequencies to pass, and Band Pass filters only allow frequencies in a selected band to pass through. A Notch filter rejects frequencies that fall within its notch.

FILTER (3) A MIDI filter is not an audio filter that is controlled by way of MIDI signals. It is a device that connects into the MIDI cable and blocks certain types of message from its output. For example, a filter could be added ahead of an instrument that has only omni modes and will respond to messages on all channels. By removing all channel messages except those on a particular channel, the instrument could effectively be used in mode 3.

FIREWIRE (IEEE-1394) A serial data transfer standard with a similar maximum bandwidth (400Mbit/second) to **USB 2.0**.

FLANGE An effect created by layering two identical sounds with a slight delay (1- 20 ms) and slightly modulating the delay of one or both of the sounds. The term comes from the early days of tape recording when delay effects were created by grabbing the flanges of the tape reels to change the tape speed.

FM SYNTHESIS (FM - FREQUENCY MODULATION) Creating sound by modulating the pitch of one sound with another. Sytrus and DX10 are capable of FM Synthesis, see pages 140 and 121 respectively.

FOURIER SPECTRUM The description of a sound that is in terms of its distribution of energy versus frequency rather than its amplitude versus time (waveform).

FRANK VAN BIESEN (FVB) Sensible Belgian, male. The Managing-Director of Image-Line.

FREDERIC VANMOL (FRED) Dangerous only to himself (Belgian, Male). Frederic is one of the key software engineers at Image-Line. Likes dogs, Sony laptops, bass guitars, huge amplifiers, eggs, BMWs and Kwatta. Frederic plays bass in a Belgian band called 'Mayflower'...what?, oh it's changed to 'Malfoys'....what? changed again...now called 'The Daybreaks'.

FREQUENCY The number of cycles of a waveform occurring in a second.

FREQUENCY MODULATION The encoding of a carrier wave by variation of its frequency in accordance with an input signal.

FRUITY LOOPS FL Studio was originally called Fruity Loops before it was changed to FL Studio, lawyers from Kelloggs claimed that people were entering music stores and mistakenly buying boxes with Fruity Loops on the label thinking they were getting breakfast cereal.....yeah riiiiiiiight ☺

FUNDAMENTAL The first, lowest note of a harmonic series. The Fundamental frequency determines a sound's overall pitch.

FX (EFFECTS) Treatments applied to a sound, e.g. Filtering, Reverberation, Phasing etc, see page 194.

- G -

GAIN The factor by which a device increases the amplitude of a signal. Negative gain will result in the attenuation of a signal.

GANGED When tracks/knobs are 'ganged,' they will move simultaneously.

GATE An effect where the volume of a sound is switched on and off, usually in time with the music in a rhythmic pattern. Very popular in 90's trance music. Gate effects can be produced in many ways including automating FX channel volume and the Peak Controller FX plugin.

GENERAL MIDI MODE A convention specifying how a sequence (a song) should be constructed, so that it will play on a variety of hardware.

GLIDE This effect plays the sound of a semitone below the pitch, then slides up to normal pitch.

GLISSANDO A rapid slide through a series of consecutive tones in a scale like passage.

GLOBAL EDITING Affecting an entire file or program. Transpose is illustrative. The contrasting function is local editing, like changing one event.

GLOSSARY A, mostly harmless, drudge.

GOL (DIDIER DAMBRIN) Mostly harmless (French, Male). Gol is the nic-name of the inventor and Chief Software Architect of FL Studio, see page 292. Gol is rumored to have the world's largest private collection of Hello Kitty products.

GOOGLE Internet search engine – **www.google.com** – where have you *been* in the last 5 years?

GROUND LOOP Hum caused by currents circulating through the ground (earth) side of a piece of equipment or system. This is due to grounding it at points of different voltage potential. It's 50-60 Hz depending on where you live and can be filtered out with EQ or better yet there are filters for stopping it available at stores like

RadioShack. If the loop is between two pieces of equipment you can try plugging your equipment into different power points.

GUI Graphical User Interface. The big, mainly grey - knobby, slidery, windowy thing you interact with FL Studio through.

- H -

HARMONIC An exact integer multiple of a fundamental frequency or tone.

HARMONIC DISTORTION The presence of harmonics in the output signal of a device which were not present in the input signal. A harmonic is a frequency related to the fundamental frequency in a particular mathematical function.

HEADROOM The difference between the average operating power level of a circuit and the point at which distortion (***clipping***) occurs.

HIGH PASS FILTER See Filter.

HUM A continuous undesired audio buzzing at the frequency of the incoming AC power line (usually at 50 or 60 Hz).

HUMANIZE A term that is used in the sense of introducing random irregularities in note-timing and velocities, in order to reduce the mechanical character of a performance. It's a shame this feature isn't available for lawyers.

HZ An abbreviation for Hertz, the number of cycles/vibrations per second of a sound or signal.

- I -

IMPLEMENTATION CHART Look for the MIDI Implementation Chart in the manual of your Master Controller (e.g., the keyboard). This will tell you what is transmitted (or recognized) for the various functions, like note number, the velocity (pressure on a key), aftertouch (change in pressure), pitch bender, control change, program change, system exclusive message, etc.

INITIALIZATION Initial means the beginning. To initialize is to set a program to a starting position - to prepare the program for use.

INSTRUMENTATION The selection of instruments in an arrangement (song).

INTENSITY The amount of modulation or volume of a sound.

INTERFACE Connection. A MIDI interface connects the computer and MIDI instruments. A user interface connects people and computers (what you see on the screen, and do on your keyboard and mouse).

INTERMODULATION A process whereby signals mix together to create undesired output frequencies that are not present at the input.

- J -

JACK A receptacle into which a matching connector can be plugged. It's also a popular 1st name in some places. Americans, in particular, like the use of adjectives and verbs as nouns - Rusty, Rocky, Chuck etc.

JEAN-MARIE CANNIE (JMC) Belgian, Male. Potentially dangerous. The joint owner of Image-Line, the company that owns FL Studio. JMC likes fast cars, fast bikes, fast boats, inflatable toys, Duvel, football, wakeboarding and blondes.

JUST INTONATION A system of tuning in which the distances between pitches are based on the natural harmonic series instead of the octave being equally divided.

- K -

KEY SIGNATURE Musical notation shows this in terms of sharps and flats after the clef. Software sequencers sometimes show a song key as 'F Major/D minor,' and indicate the number of sharps or flats. B-flat Major/G Minor has two flats, for example.

KEYBOARD There are 'alpha-numeric' keyboards for typing messages and MIDI/USB 'piano keyboards' for playing music on.

KEYBOARD ASSIGNMENT The assignment of specific sounds to an area of the keyboard. For example, the lowest octave could be drum sounds, the next octave could be an electric bass, the rest of the keyboard could have various piano samples assigned to it. It is possible to use Layers and Key-Region properties settings to achieve this effect in FL Studio. See page 85.

kHz Kilohertz, 1,000 Hertz, or one thousand cycles per second. Notice how it's written, small k big H and small z. It's an abbreviation of kilo (the prefix meaning 1000, like in Kilogram or Kilometer, oh I'm sorry you are in the USA, you don't do that there ☺) and Hertz is the last name of Heinrich Rudolf Hertz (1857-1925). He proved that electromagnetic waves were a fast vibrating charge. Hz, in physics, now signifies vibrations or cycles per second.

KNOB A control ***wheel***.

KVR Go to www.kvraudio.com, VST nirvana!

KWATTA A chocolate spread (similar to Nutella™), consumed in vast quantities by some Image-Line programmers.

- L -

LAYERING The stacking of two or more sounds on the same area of the keyboard to create a denser or more interesting sound. The 'Layer' Channel instrument is designed for this purpose, see page 85.

LINKING The process of setting one variable to control another. In FL Studio the most common form of linking is to set a knob or slider in the interface to be controlled by either 1) an ***automation clip***, 2) ***automation event***, 3) physical external controller knob/slider. See the index for advice on 'Linking'.

LCD Abbreviation for Liquid Crystal Display. A type of display, usually numerical, used in electronic equipment. Dark characters are formed on a lighter background. Requires external back lighting to be visible under low-light conditions. Many FL indicators simulate this display type and are thus called LCD displays, although they aren't really...unless they are being displayed on an LCD monitor...then perhaps they are, sort of.

LED Abbreviation for Light Emitting Diode. A semiconductor device that emits visible light when conducting current. Has replaced incandescent lamps as indicators in most electronic equipment. FL Studio simulates many of these in various interfaces for instruments or the host program.

LFO Low Frequency Oscillator. An oscillator used for modulation whose range is below the audible range (20 Hz). Example: Varying pitch cyclically produces vibrato.

LIBRARIAN Bookish person who wears glasses and manages information. That's the stereotype anyway. Other than that in music software it means a program that stores and organizes patch/sound data (usually) for a synthesizer.

LIMITER A device that acts to limit the maximum volume a channel can attain (automatic volume control). See page 222.

LINE LEVEL (LINE IN) Audio signals around 0.5 to 1.0 Volts, or a circuit which can output or accept such signals. Line Level is the standard input/output voltage level for domestic Hi-Fi equipment. All computer soundcards will have at least one output and one input at this voltage standard, use it where possible (boosting low level equipment like microphones with pre-amplifiers prior to entering the sound card) as it is a low-noise solution. Taking a lower level microphone signal and amplifying it in the computer may result in more noise.

LOOPING The process of repeating a portion of a sample over and over in order to create a sustaining sound or a repetitive rhythm (drum loops for example). The looped sound will continue as long as the key is depressed. A sound is usually looped during a point in its evolution where the harmonics and amplitude are relatively static in order to avoid pops and glitches in the sound.

LOOPTALK Mostly harmless. An online forum, for registered FL Studio users, where they share ideas and music. Sometimes you get to talk to JMC and Gol! Go to **www.flstudio.com**.

LOW PASS FILTER A filter whose frequency response remains constant up to a certain frequency, then rolls off (attenuates signals appearing at its input) above this point.

- M -

MAC Computer for the feeble minded. Abbreviation of Macintosh Computer. Give up now, there will never be a Mac version of FL Studio.

MAPPING The process of identifying patches and keys, so that sound files can be played properly. A key map will translate values for MIDI messages, so that the correct keys will be played. A patch map functions to identify the correct patches (sounds, instruments).

MARKER Something used to record a position. Markers identify, for example, musical cues. They work like tab stops in a word-processor.

MEASURE See meter.

MEDIA PLAYER Microsoft Windows application that will play audio files (WAV, MP3 etc) video files and MIDI sequencer files. Only slightly less evil than '***Real Player***'.

MELODY One of the elements of music (the others being harmony and rhythm). Melody is a succession of tones; hopefully pleasing.

MERGE To combine or blend into one. Example: Merging two tracks.

MESSAGES The net effect of MIDI-computing is sound: melodies, harmonies, rhythms. But the MIDI message (the MIDI event) itself is not a sound. Transmitted are digital commands; about 1,000 events per second.

META EVENTS In ordinary language, the prefix META often means above or beyond. In computing, a METAcharacter conveys information about other characters. In MIDI, a meta event would be illustrated by such things as track name, patch name, tempo, time signature, etc. Meta events are contrasted with data streams.

METER The basic pattern of note values, e.g., beats per measure.

METRONOME A device to mark time by producing a repeated tick (see page 31, several sounds are possible, right-click on the metronome button). The older type, a triangular box with a vibrating arm, was succeeded by an electrical unit.

MICROPHONE (MIC) You seriously don't know what a Microphone is and want a definition? An acoustic sensor apparatus that converts vibration into an electrical signal. See also ***Condenser Mic*** and ***Dynamic Mic.***

MIC LEVEL Audio signals ranging from roughly 0.001 volts (1 mV to 10mV), typically from microphones. These are the weakest signals used in audio and require significant amplification to reach ***Line-Level***. This can be up to 1000 X amplification, which is why noise can be an issue.

MIDI Acronym for Musical Instrument Digital Interface. MIDI enables synthesizers, sequencers, computers, rhythm machines, etc. to be interconnected through a standard interface. MIDI is an asynchronous, serial interface, which is transmitted at 31,250 bits per second.

MIDI CLOCK Allows instruments interconnected via MIDI to be synchronized. The MIDI Clock runs at a rate of 24 pulses-per-quarter-note.

MIDI CONTINUOUS CONTROLLER Allows continuously changing information such as pitch wheel or breath controller information to be passed over the MIDI line. Continuous controllers use large amounts of memory when recorded into a MIDI sequencer. Some standard MIDI Continuous Controller numbers are listed below although the EIII allows you to assign controllers and destinations to any Continuous Controller channel.

MIDI IMPLEMENTATION CHART Look for the MIDI Implementation Chart in the manual of your Master Controller (e.g., the keyboard). This will tell you what is transmitted (or recognized) for the various functions, like note number, the velocity (pressure on a key), aftertouch (change in pressure), pitch bender, control change, program change, system exclusive message, etc.

MIDI IN One of three ports (connections): MIDI In, MIDI Out, and MIDI Thru. MIDI In receives information from other equipment. MIDI Out sends information to other equipment. MIDI Thru duplicates the information, and sends it to other equipment. By means of the latter, a synthesizer can echo messages to other synthesizers.

MIDI MAPPER Microsoft's utility program, which can help in remapping patch, channel, etc. during playback.

MIDI NOTE NUMBERS The numerical values (0 - 127) assigned to notes of the Western Musical Scale.

MIDI OUT One of three ports (connections): MIDI In, MIDI Out, and MIDI Thru. MIDI In receives information from other equipment. MIDI Out sends information to other equipment. MIDI Thru duplicates the information, and sends it to other equipment. By means of the latter, a synthesizer can echo messages to other synthesizers.

MIDI SOUND GENERATOR A synthesizer (or sampler), for converting MIDI events into sound.

MIDI THRU One of three ports (connections): MIDI In, MIDI Out, and MIDI Thru. MIDI In receives information from other equipment. MIDI Out sends information to other equipment. MIDI Thru duplicates the information, and sends it to other equipment. By means of the latter, a synthesizer can echo messages to other synthesizers.

MIXER A device for combining, controlling and routing audio signals. A MIDI sequencer can virtually mix MIDI tracks or channels. FL Studio has a 64 channel mixer see page 182.

MIXING The process of setting the relative volume levels and equalization of the parts in a song. See page 180.

MODULATION In music, one usually thinks of modulating as passing from one key to another, by means of intermediate chords. In terms of synthesis it means one varying signal changing another. So a sine-wave may modulate to pitch of a sound to create a vibrato effect.

MODULATION INDEX The depth of modulation when performing frequency modulation.

MONITOR In this context monitor will have one of three meanings: 1) to check the level of a channel or instrument with a meter. 2) A computer screen display. 3) A speaker designed for mixing music. The design philosophy is to achieve a flat output frequency response for a flat input frequency spectrum. That is, not to change the tone of the input sound in order to allow the person mixing to hear accurately their deliberate changes to the mix. See also page 10.

MONO (MONOPHONIC) **A wave-file/sound** with only one stereo channel operating OR both left and right stereo channels carry the same signal OR only one channel is operating) OR **A musical instrument** that is only capable of playing one note at a time (TS404 for example) A trumpet is a monophonic instrument, the piano is poly-phonic (many parts) but can be played monophonically. **Music** with only one voice part.

MP3 An abbreviation of MPEG level 3. A lossy audio compression standard useful for sharing music in bandwidth limited situations (such as the Internet). FL Studio can save to this format See page 277.

MULTI-TIMBRAL In sequencing, a multi- timbral sound module can play several parts on different channels simultaneously. A multi-timbral device is one that is prepared to sound like more than one instrument at a time. It also sounds like a good term to describe anything made out of several species of wood.

MULTI-TRACK A way to record a complex musical piece by dividing it into simple tracks, and combining the tracks during playback.

MULTI-TRACK RECORDING Normally, one records on a single track ('Normal Mode' recording). Multi-track recording is feasible, however. Example: From a guitar, with each string on a different channel.

MULTI-VOICE MODE A setting on a multi-timbral tone generator (such as a keyboard) for receiving multiple MIDI channels, each channel having a different voice (instrument).

MUSICAL SCORE Most often, the written copy of a musical composition. In FL Studio, the step-sequencer, piano-roll, or play-list may be considered to be your musical 'score'.

MUTE To turn off or silence an audio signal. Use this in the channels or mixer to listen exclusively to one part or instrument. Why don't children come with a mute switch?

- N -

NEAR FIELD Describes the audio space within about 2 meters (5 feet) of the listener.

NEAR FIELD MONITORS Speakers designed for mixing music that are intended to sit within a few feet of the listener. These speakers are usually 'book-shelf' sized. The idea is that if they are close to the listener then room reflections have less chance of interfering with the perceived sound. See also ***Monitor*** and page 10.

NOISE That disturbance of a signal that might occur due to interference, typically a hiss (see ***White Noise***) or buzzing sound. The term is also useful in classifying 98% of the sounds that children make.

NOISE REDUCTION Any technique for reducing the amount of undesired noise in an audio signal. There are some quite sophisticated techniques available that take a sample of the noise (if it is available in isolation) and can remove it from a given signal. GoldWave, with a generous demo period, has this function. (effect > filter > noise reduction) see - www.goldwave.com.

NORMAL MODE When a (controller) keyboard has this setting (as contrasted with split, or fingered modes), the sounds are all of one voice, from the lowest note to the highest. In this mode, the resemblance is to an acoustical instrument. Related keywords: FINGERED MODE, SPLIT MODE

NORMALIZE A digital processing function that increases the amplitude of a sound file until the peak amplitude of its loudest sample reaches 100% of full scale. This will make the sample louder. If that is still not loud enough consider using compression.

NOTATION Writing text or music.

NOTATION PROGRAM Also called 'score writer' programs, these permit music to be written into the computer in standard music notation form. Some programs of this type are simply intended as a means of producing sheet music, but many now support MIDI, and will operate as step-time sequencers. In fact some will turn MIDI data into notes on the staves, and will operate as real-time sequencers (but will not necessarily work particularly well in this role).

- O -

OCTAVE A distance between two notes with a frequency ratio of 2/1. Alternatively, 12 Semi-tones or 1200 Cents.

OCTAVE NOTATION Software and electronic keyboards use notations like F4 to represent the specific note (F) located in the 4th octave of an acoustical piano.

OGG An abbreviation for the Ogg Vorbis ***codec*** favored by ***gol*** and supported by FL Studio. Ogg is a completely open, patent-free, professional audio encoding and streaming technology with all the benefits of Open Source. This is an alternative to ***MP3***.

OMNI When 'omni' is 'on', an instrument will respond to messages on any MIDI channel. When 'omni' is 'off', the instrument will only respond to one particular channel (mode 3), or each voice will be assigned to a particular channel (mode 4).

OMNI MODE Refers to what MIDI channels your Slave is listening to. With Omni mode on, it will listen and respond to messages on all 16 channels. With Omni mode off, it will listen only to the one MIDI channel that you tell it to. If your application is simple and you don't want to deal with MIDI channels, you can leave Omni mode on. For instance, if you are just playing a keyboard with another tone module at the same time, you probably don't need to worry about this. But if you want to address different modules or different sounds for different parts, you'll have to set Omni mode to off

OVERLOAD Distortion which is caused by exceeding the dynamic range of a circuit.

- P -

PADS Any sound that is used to pad-out (fill out) the background. These are usually designed to be played as chords and have relatively long slow attack and decay envelope settings. Check the PAD presets in Sytrus to get an idea, page 140.

PAN/PANNING Moving apparent location of a sound in space. It is achieved by varying the relative volume of the sound emanating from the speakers in the play-back system. The 'balance' control on a hi-fi is a form of PAN. See also ***Triangular Panning/Circular Panning***.

PARALLEL INTERFACE A computer interface in which data is passed simultaneously over many wires. A Parallel Interface is usually much faster than a serial interface.

PARAMETER Data that will be acted or operated on. In mathematics, a variable or an arbitrary constant. Examples: pitch bend, sustain, voice number, volume, reverb level.

PATCH In some early keyboard synthesizers, one selected 'instruments' to play (e.g., vibraphone, clarinet.) Later, the term 'voice' emerged, in part, because some of the sounds went beyond instruments (police whistles, human voices, etc.). In contemporary computing, the word 'patch' is prominent, one reason being that a single keyboard setting, like 99, may encompass a large range of percussive sounds. In any event, to a sequencer, the patch setting will determine the nature of the sounds.

PASSIVE MONITOR A speaker designed for mixing music without built-in amplification (see also ***Active Monitor***). The design philosophy is to achieve a flat output frequency response for a flat input frequency spectrum. That is, not to change the tone of the input sound in order to allow the person mixing to hear accurately their deliberate changes. See also page 10.

PATCH LAYOUT A potential source of trouble for MIDI users. Manufacturers of synthesizers have not standardized the correspondence between patches and numbers. On a Roland keyboard, the Celeste patch number might be 24; on a Yamaha 09. Microsoft's MIDI Mapper is designed to help rectify this.

PATTERN The musical note and automation data associated with one of 999 possible unique sequence 'stacks' of the Channel window. These may be any length and are called ***Pattern blocks*** when placed in the Playlist.

PATTERN BLOCK The graphical representation of a Pattern in the Playlist window.

PATTERN MODE FL Studio will play and record into the currently selected pattern, see page **Error! Bookmark not defined.**..

PCM Pulse code modulation a process of digital recording, for example used by Windows PCM format.

PEAK METER Are displays that are designed to catch the very fastest of transient peaks of an audio input. These peaks may clip so spotting them is useful, See also ***VU Meter*** and ***Bar Graph***.

PERCUSSION A percussive instrument is sounded by striking or shaking. Examples: Bass drum, snare, bongo, cymbal, high-hat. By extension, the term also encompasses so-called 'background sounds,' like wind chimes, thunder, voices.

PHANTOM POWER Power supplied to a microphone (usually through the microphone cable from the mixer, soundcard or preamplifier), most ***condenser*** microphones are powered this way so if you are buying one check you have the ability to power it (this power is usually supplied by a mic-preamp, mixer or high-end sound card). Phantom power is usually around 48V DC.

PHASE ('In-phase/Out-of-phase') Actually refers to the polarity of an electrical or acoustic signal. If two or more signals or devices are 'out-of-phase' with respect to each other, cancellation or other disturbance of the combined output can result. To hear what this sounds like put a Fruity Phaser on a mixer track in FL Studio, page 218, this works by artificially combining out-of-phase copies of the input signal. Read the next entry also.

PHASE CANCELLATION Undesirable dips and peaks in frequency response caused by mixing the outputs of two microphones which are picking up the same sound but with different arrival times. For example, this can occur when the sound from two microphones that are placed near each other are re-combined. There is a phase switch in FL Studio that can help reduce these effects, see page 217.

PHONE PLUG CONNECTOR (PHONO) A type of plug-in audio connector with a 1/4-inch (6.3 mm) diameter metal contact sleeve, and either one or two signal contacts. Widely used in the telephone industry, particularly in the past, hence the name. This shape was adopted for things like headphones, connecting electric guitars to the amplifier etc. A smaller 'mini' version of this plug is more commonly used on most sound-cards and portable audio devices.

PIANO-ROLL EDITOR A common notation used for editing by many sequencers. The notes of each track are shown as horizontal bars, the vertical position representing pitch; the horizontal length representing duration of the note (or chord). The best piano-roll in the world is in FL Studio see page 42.

PITCH The property of a musical tone, determined by frequency.

PITCH BEND A synthesizer performance technique that involves sliding the pitch of a sound up or down by means of a controller. If you don't have an external controller you can use ***automation clips*** to perform pitch bends.

PITCHBENDWHEEL A wheel on the keyboard that allows notes to be bent up or down. (Example: a sliding trombone sound.) 'Pitch bend' is a MIDI message.

PITCH SHIFTING The process of changing the pitch of a sample. More commonly it refers to the process of changing pitch without affecting the sample duration. There are several related concepts here - Time and pitch are normally locked together, when a sample is played back at pitch other than the 'root' both time and pitch of the sample will be affected. Higher pitch = shorter time, lower pitch = longer time. This occurs because the sample pitch is manipulated by varying the play-back speed, as you would with a mechanical device such as a tape or record (in reality it's more complex but that's a good analogy). It is however possible (with CPU intensive processing) to change the pitch of a sample (***Pitch shifting***) OR the duration of a sample (***Time Stretching***) without affecting the other. There are several ways to do both pitch and time stretching in FL Studio 1) The high quality, non real-time Channel tool 'Time Stretching' (see page 90) or 2) The lower quality, real time - Granulizer instrument (see page 123).

PLAYLIST The window where ***pattern blocks*** are placed to be performed in the order placed. The sequences are pre-programmed from the Channel window. See page 230.

PLAYER In the realm of MIDI-computing, the sequencer is still the Virtuoso. But MIDI players are prominent too. They play the sound files. They compile Playlists of songs, and sometimes group them into albums.

POINTER In FL Studio it is an orange triangle on the top edge of the Piano roll and Playlist windows that moves to show the notes being played. As a computing term it means an on screen mouse pointer, I can't believe you are looking this up!

POLY In a polyphonic mode an instrument can handle several notes at once. In mode 3 it is possible to have polyphonic operation on each MIDI channel. The maximum number of notes available at one time is determined by the instrument, the MIDI specification does not set any upper limit.

POLYPHONY From the Greek, meaning variety of tones. In MIDI, the question is: 'How many notes can be played simultaneously?' Maximum polyphony cannot be exceeded. FL Studio has no theoretical limit! You can artificially limit polyphony to save CPU and for effect in the channel settings, see page 78.

PORT It's a location in hardware where data is passed in and out. In setting up MIDI, one must make port assignments, so that channels can be correctly addressed.

PPQ (PPQN) Pulses per quarter-note. A measurement of time resolution. This can be set from the project settings menu, see page 271.

PRESET A preprogrammed setting for an Instrument or Effect. See page 16 .

PRESSURE SENSITIVITY The ability of an instrument to respond to pressure applied to the keyboard after the initial depression of a key. Sometimes called ***Aftertouch.***

PROGRAM CHANGE Like controller change, this event will be displayed in the Event List Editor. An illustrative program change would be the introduction of a new voice (instrument).

PROGRAM DUMP Many MIDI equipped instruments have the ability to send out via MIDI the full contents of their program memory, or to provide a 'program dump'. This can be used to send a set of programs from one instrument to another (but they will normally need to be instruments of exactly the same type). This facility can also be used to send data to a computer or MIDI disk drive, and then feed it back again when and as required. There is no special MIDI program dump message, and this facility operates under system exclusive messages.

PROXIMITY EFFECT When microphones are placed very close to the sound source there is a boosting of the bass frequencies, known as the proximity effect.

PULSE The tick of a computer clock is sometimes referred to as a 'pulse.' Example: One clock pulse might be defined as 1/240th of a quarter-note.

PUMPING Usually undesirable and objectionable gain or background noise level changes in a compressor/expansion system. The phenomenon is sometimes deliberately induced as an audio effect, particularly on drums. A slower, somewhat less noticeable form is called breathing. Note in order to hear this you need some background noise in the original sample.

PUNCH-IN When recording, punching in over-writes a previously recorded track starting at the punch in point.

PUNCH-OUT When recording, punching out stops the recording process started by a punch in, thus preserving the previously recorded track starting at the punch out point.

PUNCH-RECORDING A feature that allows automatic on-off recording at specified points. FL Studio can't do this so don't ask. But why would you? It's an old trick from the days of linear tape-based recording, in FL just re-record a new clip for the section you want and slice up the resulting tracks to play what you want when you want.

- Q -

QUANTIZATION See also ***SNAP***. To quantize is to force all notes played to fall on the nearest beat or beat fraction specified. There is a menu function in the ***Piano roll*** and ***Playlist*** to quantize entered events (see pages 49 and 233 respectively) FL Studio can have different quantization for the Piano roll and the Playlist.

QUANTIZATION (AUDIO) The process of representing a constantly variable input such as an audio signal in a finite set of defined levels. The process of digitally recording sound usually involves quantizing the audio signal into 16 bit (65,536 possible levels) .

QUANTIZING ERROR When a continuous analog signal is digitally recorded it is represented in a 'stepped' digital format. Each step is a 'quantization level'. 16 bit audio has 65,536 levels available to quantize the incoming sound. When the analog value being quantized (recorded) falls between two digital 'steps' the analog value must be represented by the nearest digital value. The difference between the continuous analog waveform and the digital representation is the 'quantization error'. In a complex signal such as music

quantization error appears as broadband noise (similar to white noise that pumps in an out over the top of the music), ***Dithering*** can significantly eliminate perceptual effects of this type of error. It is particularly important when converting from, say, 32 or 24 bits down to 16 bits.

QUANTIZE See ***Quantization***.

- R -

REALTIME In MIDI, there are two types of recording procedures: (1) real-time; (2) step-time. The former resembles traditional recording, as with a tape recorder. Step-time recording is really sequential: note-by-note, chord-by-chord.

REALTIME CONTROLS Occurring in actual time or live.

REAL PLAYER Thinly veiled attempt to stream advertising directly to your PC (see ***Media Player***).

REALTIME SEQUENCER A sequencer where the music is entered into the unit simply by playing it on a MIDI keyboard. The sequencer records the data from the keyboard, which is stored in its memory together with timing information. The ability to change the playback speed is a standard feature. The more up-market systems permit note values and durations to be edited, and multi-track sequences to be built up.

RECORD To capture something reproducible into memory or on the hard-drive of a computer. MIDI recording for example does not 'record' sound but note data, in a similar way a word document capture keystrokes on an alpha-numeric (typing) keyboard. Because of established usage, however, the words 'record' and 'recording' often appear in MIDI- computing, along with 'play,' 'rewind,' 'fast forward,' etc. In MIDI-computing, these words are really metaphors. A typical sequencer will 'record' all of the MIDI events received, along with the time they were received.

RESET Keyboards, like computers, sometimes 'lock up.' To restore normal operation, the System Reset is used. There is another meaning in MIDI software: Reset means to return to the first measure.

RESONANCE A frequency at which a material object will vibrate. In a filter with resonance, a signal will be accentuated at the cutoff frequency.

REST In music, a rhythmic silence. Examples: a 2-beat rest, a quarter-note rest.

REVERBERATION (REVERB) The reflected sound in an acoustic space. If you clap you hands in a bathroom or concert hall the trailing sound is quite different. In enclosed spaces reflections build up and overlap to create the 'reverberant' sound. Adding Fruity Reverb to instruments, vocals or loops in FL Studio will give them a 'live' or 'real' feel. See page 219. Note: reverb is easy to 'overuse' and it can make the mix sound muddy or confused.

- S -

SAMPLE A digital recording. Usually stores as a WAV or MP3 format file.

SAMPLER A device that digitally records sounds for later performance. It can usually manipulate these sounds in a variety of ways (your soundcard is a sampler and so is FL Studio by this definition). More recently sampler refers to a plugin that plays back sampled sounds and may not actually sample anything (crazy!).

SAMPLING Capturing an analog sound and reproducing it digitally.

SAMPLE RATE When digitally sampling a signal, the rate at which volume level measurements (***see quantization***) of the signal are taken (CD measures amplitude 44,100 times per second, 44.1 kHz sample rate).

SEQUENCER A device which steps through a series of events. The FL Studio has several 'sequencer' like functions including the ***Step sequencer***, ***Piano roll*** and ***Playlist***. Together they record keyboard data, note data, audio, program changes, or real-time modulation data to be played back later.

SERIAL (1) Appearing in succession, one at a time. MIDI messages, for instance, as displayed in an Event List.

SERIAL (2) MIDI is a form of serial communications system, which simply means that it sends information one 'bit' at a time. Parallel systems send data several 'bits' at a time, and are usually much faster. They need multi-way connecting cables though, and often have very restricted ranges (a couple of metres in some cases). Although slower, a serial system is more practical for many applications.

SIGNAL PROCESSING The art of modifying an existing sound through the use of electronic circuitry.

SLIDER An input-device to increase or decrease volume. Also refers to an on-screen image (like a button control) that one can move with a mouse.

SMPTE A standardized time code developed by the Society of Motion Picture and Television Engineers. The time code is used to sync external hardware with the film.

SNAP An automatic quantization where notes or patterns 'snap' to the grid they are placed on. This can be set for the Piano roll and the Playlist independently. None is also an option (and the installation default), in this case events will slide freely at the resolution of the PPQ setting.

SOFT SYNTH (SOFTWARE SYNTHERSIZER) Generally used to refer to a synthesizer implemented on a PC platform such as a VSTi or DXi instrument. However most 'hardware' synthesizers since about 1984 have been nothing more than software running on dedicated DSP chips so who knows why we care about this distinction?

SOLO If you want to listen exclusively to one track, you can mute all other tracks. Alternative: Select a track to 'solo', the FL Mixer AND Channel window have this feature.

SONG CLEAR To erase the contents of all tracks.

SONG POINTER In FL Studio the Piano Roll and Playlist have a small orange triangle that will run along the top of the window to show what is being played. More generally it is data that allows equipment to remain in sync even if the master device has been fast forwarded. MIDI Song Pointer (sometimes called MIDI Song Position Pointer) is an internal register (in the sequencer or auto locator) which holds the number of MIDI beats since the start of the song.

SONG MODE FL Studio will play back using the data in the Playlist. See also ***Pattern Mode***.

SOUND CARD Originally a circuit board (card style) inside the computer to convert a digital audio files into analog electrical signals that can be fed to speakers (or an amplifier and speakers). This process is called Digital to Analog conversion. The chip that does it called a DAC. The reverse is also possible taking analog sound and converting it into a digital format (analog to digital conversion). So a soundcard (at its simplest) is a DAC and a small amplifier to feed the output jack with a reasonable signal level for connection to a hi-fi or speakers. However, today, many PCs ship with the DAC built into the motherboard and it's still called a sound-card. More recently with fast connection protocols like USB and FireWire some sound-cards have migrated out of the PC into a separate box, where there is less 'digital noise' from other components. FL Studio is best with a particular type of sound-card - an ASIO compliant one. This allows much faster communication between the Soundcard and the CPU, which is a good thing for music production. Until recently sound could be allowed to have a lower priority in the pecking order, no one minds too much if the sound in their game glitches.

SOUND DEVICE Any device is part of the system's hardware. Examples: a printer, mouse, modem, etc. A sound device might be, for instance, a MIDI synthesizer, a CD-ROM drive, a videodisc player.

SOUND DRIVER Device drivers are software that control communication between devices (a mouse, printer, modem.) and the computer. A sound-driver controls the sound card or the sound device, such as a MIDI-compatible synthesizer. The sound driver must be correctly configured for your computer.

SOUND MODULE The component in a device (such as a keyboard) that produces the sound (e.g., a violin melody, a drum rhythm). This is another term for MIDI sound generator.

SOUND RECORDER Microsoft's Windows accessory that can play, record, and edit sound files in the WAVE (non-MIDI) format.

SPEED, PITCH Perhaps the most important capacity of a sequencer. Tempo can be changed without affecting pitch. Thus, a difficult passage can be recorded slowly, then played at a faster tempo, with no change in pitch.

SPLIT MODE Divides a keyboard into two sections, each of which can play a different instrument. Example: From the split-point (like C#3), the left hand can be producing the sounds of an organ, while the right hand plays a flute melody line.

SPLIT POINT In a split mode, the location on a keyboard where one voice (instrument) is differentiated from another. G2, for example, might be set to allow one voice (say, choir) in the left hand, another voice (say, violin) in the right hand.

STANDARD MIDI FILE Identified by its extension (.MID, sometimes .MFF or .SMF), this is a file that can store MIDI messages, such as songs. The data in a MIDI file can be played, manipulated, edited. A MIDI file comprises actions performed on an instrument (keys pressed, how hard.) There is a standard MIDI file format. A principal advantage of a MIDI file: It uses comparatively little disk space, but, more importantly, it is a standard across platforms and sequencers.

STAVES Plural of staff, those horizontal lines and spaces on which traditional western music is written.

STEP TIME A sequencer mode where events are entered one at a time.

STOMP BOXES Floor pedals (FX) for enhancing tones, used principally by guitarists. Their hands are full of guitar so they activate the floor mounted FX unit with their feet...stomp on it! ☺

SUBTRACTIVE SYNTHESIS The process of constructing a sound by starting with a bright complex sound and then removing harmonics with a filter. A low pass filter is most commonly used. The cutoff frequency of the filter is usually dynamically varied, adding motion and character to the sound. Subtractive synthesis is the type used on the FL Studio generator instruments - Wasp, TS404, Simsynth and 3OSC, for example.

SUSTAIN To sustain is to hold a note (or a chord). The musical tones may still fade out gradually depending on the sound.

SYNCHRONIZE To make synchronous or simultaneous. Example: to synchronize a drum pattern to play with melodies and chords on a synthesizer. MIDI synchronization is a coordinating function, involving a sync signal.

SYNTHESIS The process of creating sound via electronic circuits or computational means, See also ***FM Synthesis***, ***Additive Synthesis*** and ***Subtractive Synthesis***.

SYNTHESIZER (SYNTH) A device driven by a microprocessor, which contains a programmable chip. Examples of instruments that can control synthesizers: Guitar, keyboard, wind, string, drum controllers. The keyboard itself does not produce musical sound. A synthesizer circuit, built into the keyboard, accomplishes this function. Originally, a synthesizer was so called because it synthesized acoustic instruments. Nowadays, the term refers to the sound-generating circuitry of any MIDI gear. Another term is sound module.

SYSEX System Exclusive data is MIDI's way of letting each synthesizer manufacturer transmit private data about their products. A System Exclusive message has a manufacturer ID, and the rest of the message is completely proprietary and varies for each manufacturer and even each of their products. You can load and save individual Sysx banks to the file format used by the popular public domain MIDIEX bulk dump utility. The file extension used is .SYX. Most other utilities use the same format and extension.

SYSTEM MESSAGES These are the MIDI messages that do not carry a channel number in the header byte. They are therefore responded to by every piece of equipment in the system that recognizes them. These are mainly the MIDI clock and associated messages.

- T -

TAPER A digital signal processing function that fades a sound in or out between two points. Tapering permanently modifies a sound.

TARDIS Acronym from 'Time And Relative Dimensions In Space'. Time travel device used by Time Lords.

TEMPLATE Way of saving a start-up or default state for a program. FL Studio allows you to create your own templates so that you can start a new project with your favorite instruments, FX and routings (see page 19) .

TEMPO In music, the rate of speed (like allegretto). Electronic keyboards provide controls to set or change tempo. A quarter-note setting may range from 40 to 240 beats per minute. Software sequencers also set and change tempo. Examples of tempo settings: Viennese waltz 190 bpm; disco-rock 104 bpm; swing 166 bpm. Sequencers display the exact beat (e.g., beat number 29) of the music being recorded or played.

THRU A THRU socket is to be found on many items of MIDI equipment. It simply provides a replica of what is received on the IN socket. In a multi-unit system the THRU socket on one unit can be coupled through to the IN socket of the next unit (chain connection).

THRU-BOX Not all MIDI units have THRU sockets, and in particular, they are often absent from keyboard instruments. A THRU-box has a MIDI IN socket and several THRU output sockets. In a multi-unit system the OUT socket of the controller connects to the IN socket of the THRU-box. The THRU outputs then connect to the IN sockets of each instrument etc. in the system (star connection).

TIMBRE Tone color. The quality of a sound that distinguishes it from other sounds with the same pitch and volume.

TIME BASE The number of clock ticks per beat. Illustrative range: 120-768.

TIME SIGNATURE In traditional musical notations, this is expressed as a fractional sign, like 3/4. The denominator indicates the unit for the beat; the numerator shows the number of notes per measure.

TIME STRETCHING See ***Pitch shifting*** or borrow a Tardis.

TONE GENERATOR Essentially, a synthesizer without a keyboard.

TOUCH RESPONSE A feature of some electronic keyboards, enabling one to control loudness according to how hard the keys are pressed.

TRACK In MIDI, the term 'track' designates a location where one records or plays back a musical message, - usually a portion of the total arrangement. To illustrate, one might record an oboe melody line on Track Two, then record a bowed bass line on Track Three. When played, the sounds can be simultaneous. Most MIDI software now accommodates 64 tracks of music, enough for a rich orchestral sound. Important: Tracks are purely for convenience; channels are required.

TRACK CLEAR To erase the contents of a specific track.

TRACK MERGE To merge the contents of two tracks and store in a third track.

TRACK NAMES Names like 'melody line,' 'bass line,' 'left hand,' etc. are assigned to tracks to help determine the instrumentation of a sequence. Right click on the track name in the Play list.

TRANSCRIPTION The word has been used extensively in music. Example: arranging for some instrument or voice other than the original. In MIDI, a common usage refers to converting a MIDI file into musical notation for printing. This is accomplished by notation software.

TRANSPOSE To change the musical key (or octave) a piece of music is recorded in.

TREMOLO A cyclic change in amplitude, usually in the range of 7 to 14 Hz. Usually achieved by routing a LFO (low frequency oscillator) to a VCA (voltage controlled amplifier).

TRIANGULAR PANNING A panning scheme where the apparent position of the sound is moved in the stereo field with linear ramping of the L and R channel volume. This may result in apparent changes in loudness as the sound is panned, see ***Circular Panning***.

TRUNCATION When manipulating a sample, truncation shortens a sample's length by trimming off parts of the beginning and/or end.

TUNING 440 Hertz (an A3, MIDI value of 69) is the standard tuning value this is. However, the pitch of a synthesizer can be altered, raised or lowered. Changes in the tune value are expressed as plus or minus cents.

TWEAK(S) Manually moving a knob or control inside FL Studio or on a controller. Recording tweaks is the domain of ***Automation events***.

- U -

UNDERRUN In FL Studio the situation when the audio buffer runs out of data. This means the soundcard will not receive audio for a short period of time and often results in an audible click or pop. See page 11 & 266.

UNDO The ability to reverse some action. In FL there is a history list in the browser that allows you to undo (up to) 99 last changes anywhere on the interface, see page 68.

USB (UNIVERSAL SERIAL BUS) Data transfer protocol for PCs, with yet another bunch of connectors to get your head around. There are presently two common standards USB 1.1 @ 12 Mbit/second (original) and USB 2.0 @ 480 Mbit/second (more recent). Many controller keyboards and external interfaces now connect to PCs via USB. USB is replacing **MIDI** as a communication standard in the computer music industry.

- V -

VCA Voltage Controlled Amplifier. A circuit whose gain is determined by a control voltage.

VCF Voltage Controlled Filter. A filter whose cutoff frequency or resonant frequency is determined by a control voltage.

VELOCITY The measure of how hard a note is hit on the keyboard controller. This usually controls note volume but can also be mapped to filter-cutoff etc see page .

VELOCITY SENSITIVITY A keyboard which can respond to the speed at which a key is depressed; this corresponds to the dynamics with which the player plays the keyboard. Velocity is an important function as it helps translate the performer's expression to the music.

VIBRATO A cyclic change in pitch, usually in the range of 7 to 14 Hz. Violin players, for example, frequently 'wobble' a finger on the string to create a vibrato effect, they often do this to hide poor pitching technique and because the sound of the violin is just so boring otherwise. The result is a wobbly boring sound.

VOICE A single note or sound generated by an instrument.

VOICE EDITOR The minimalist approach to synthesizer controls has made setting up the required sounds a relatively long and difficult process. A voice editor program provides on-screen controls that can quickly and easily be adjusted. New control settings are almost instantly sent to the instrument via MIDI so that the effect of adjusting controls can be heard, and fine adjustments easily made.

VOLTAGE PEDAL A pedal which outputs a control voltage which is dependant on its position.

VU (VOLUME UNIT) METER Originally, an audio output meter for broadcast and recording studio consoles with precisely defined reference level and movement characteristics to give a reading of the 'average' output levels. 'VU meter' has become the common name for any audio output metering, particularly on mixers and related equipment. See also ***Bargraph***.

- W -

WAVEFORM A representation of a wave's amplitude over time. Synthesizers often name them according to

WAVELENGTH The distance that a wave travels in the time it takes to go through one full 360 degree phase change, or one cycle. Audio: At room temperature, one wavelength at 100 Hz is approximately 3.5 m (11 feet); at 10 kHz, about 3.4 cm (1.3 inches).

WAVESHAPER A device for distorting an input waveform according to a user-selectable shape. Each cycle of the wave input wave is 'shaped' according to the input/output shape characteristics (see page 226).

WHEEL A control ***knob***.

WHITE NOISE Full audible spectrum hissing sound. This can be filtered to produce variations known as 'Pink' and 'Blue' noise. Useful in Synthesis, most FL Synthesizers will have a noise source built in.

WOW What you say every time you use FL Studio.

WRITE PROTECT To protect data (either on a disk or in memory) from being written to, although data can still be read.

- X -

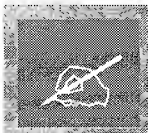
XLR This is a type of electrical connector used on good microphones, has 3 pins (the connector is designed for rough handling on the road and provides balanced signal transmission).

- Z -

ZERO CROSSING The point where the polarity of an electrical or sampled signal changes from positive to negative (or vice-versa) as it passes through zero. A zero crossing provides a convenient point to splice two sounds or create a loop-point because the levels of the two splice points are the same level. When looping if this is not the case the loop will 'click'.

ZOOM To magnify the image on a monitor screen, especially useful when editing notes in the Piano roll. See page 16. Image-Line research suggests 6% of FL Studio users fail to discover the zoom function.

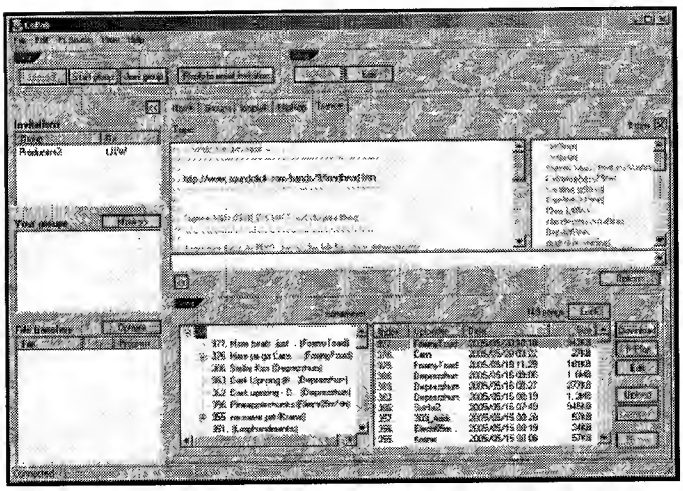
ZZZ Now this book is done, time to sleep...



NOTE: This Glossary is adapted, with permission, from glossaries published by the very nice people at **www.midipage.nl** and **www.audio-technica.com**, permission that will certainly be revoked once they see what we have done to their work ☺

Other Image-Line Software

Collab



Collab (on-line collaboration tool) - is like a chat program, only it's main goal (this is where it's different) is to allow users to work on projects together in a easy and more organized fashion. Collab is a stand-alone program that invokes/opens the FL Studio engine as needed.

To work on a project, you first need to create a group. Then, people can ask to join your group or you can invite them; you ultimately decide who can cooperate. Of course, you can create multiple groups, and have different members in each one. Nothing stops a user from being a member of multiple groups, either. You can also create groups where anybody can join.

On LoopTalk, you upload the FLP/ZIP file, then wait for someone to download the file edit it, and upload again. That method presents a number of problems:

- The thread can get horribly long with off-topic replies and new updates of the track,
- You can get lost very quickly with all the versions of the track and the topic can drift into obscurity if no replies are made on a regular basis.
- Anybody can edit your song, or worse, steal it and use it their own tracks (although it is unlikely this would happen, it can prevent you from sharing some of your most important tracks).

With Collab, you can decide who you work with and so nobody else can interfere. You will also be better able to organize your projects. You can invite friends to work on the song and it's available in one easy to find location. Both ZIP and FLP files may be uploaded so that you can share sounds where necessary.

The Collab program is an optional install feature (check box) available from the latest main FL Studio installation package, see - **www.tucows.com/preview/209204**

EZ Generator

EZ Generator (Web authoring tool) - So you are impressed with FL Studio and have made some banging tracks. A great way to publish your music is on your own web-site. What you may not know is that Image-Line also develop 'EZGenerator', a website building tool that is to Web publishing what FL Studio is to music production – intuitive and easy. EZGenerator is notable for:

- **Templates** – Over 2000 Pre-made templates and more importantly many designed specifically for 'music websites' (Editor: perfect! ☺).
- **Photos** – Access to a huge, royalty free, stock photograph collection for use in your site.
- **Publish MP3's** – EZGenetator comes with Built-in MP3 player capability that can be added to your web-site.
- **EZ** – FL Studio doesn't make you understand MIDI and Sysex data to make great music and so with EZGenerator you don't need to know HTML, Java or Flash to create sophisticated and attractive website.
- **E-Commerce** – Bypass the major music labels and sell your tunes direct to your fans. EZGenerator comes with a great E-Commerce module. In no time you'll be doing business on the worldwide Internet. You can offer your products for sale and through our payment partner you can **accept any major credit card** (VISA, MasterCard, American Express & Discover). Also support for bank wires, checks and faxed orders is available to you.

To find out more and download the demo go to...**www.ezgenerator.com**

WHY REGISTER FL STUDIO?

Registered FL Studio owners can download Gigabytes of high quality, and more importantly, FREE samples, at **www.samplefusion.com.** Furthermore you gain access to a wide range of other features such as:

- **Lifetime free updates** – When other companies are charging $200+ for an upgrade that does little more than fix bugs and adds features that should have been included in the first place, Image-Line continue to give you the latest version of your program for free. Why? The Image-Line business model is to sell you new and interesting plugins/tools. On that note, you can show your appreciation to the IL team by upgrading your FL version to a higher level, purchasing plugins, other Image-Line products like EZgenerator or encouraging friends to buy FL Studio.
- **Discounts** – Once you register your shop counter will track all the IL products you currently own and give you a progressive discount, the more you buy, the more you save (up to 50%). If you want to jump straight in the XXL version of FL Studio gives you all the native plugins for an up-front 50% discount.
- **Collab** – In an online collaboration tool allowing you to, chat, interact and compose music with other FL Studio users. Collab allows you to set up your own chat groups and decide who can access the ZIP/FLP file in that group.
- **Online video tutorials** – There are a wide range of topics from Audio Recording (how to record a guitar, for example) to using the Wave editor. There are over 30 step-by-step videos and the library is continually being expanded.
- **FL Studio forums** - This includes tech-support, chat areas, magazine reviews and more.

Some of the samples available at www.samplefusion.com

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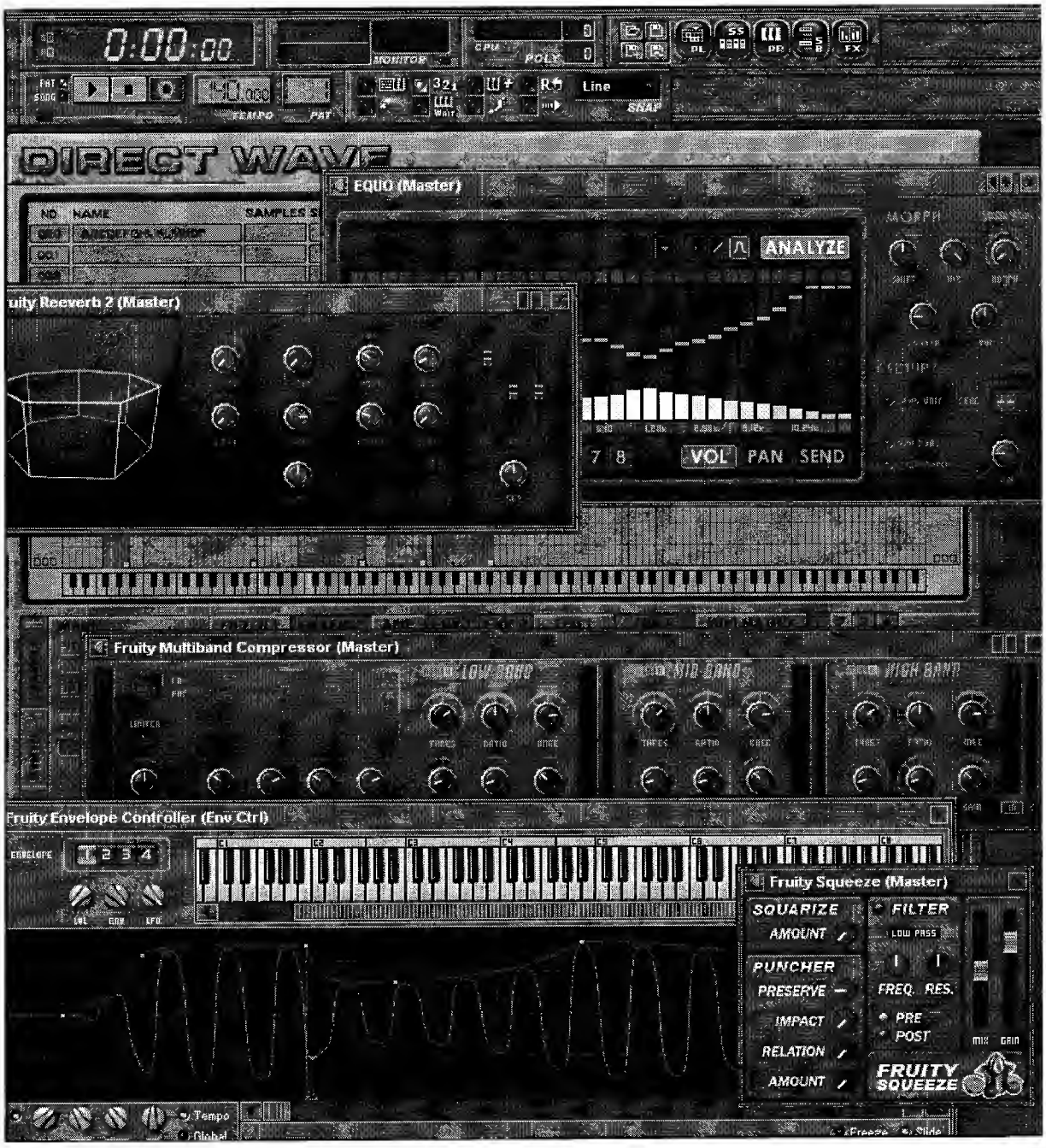
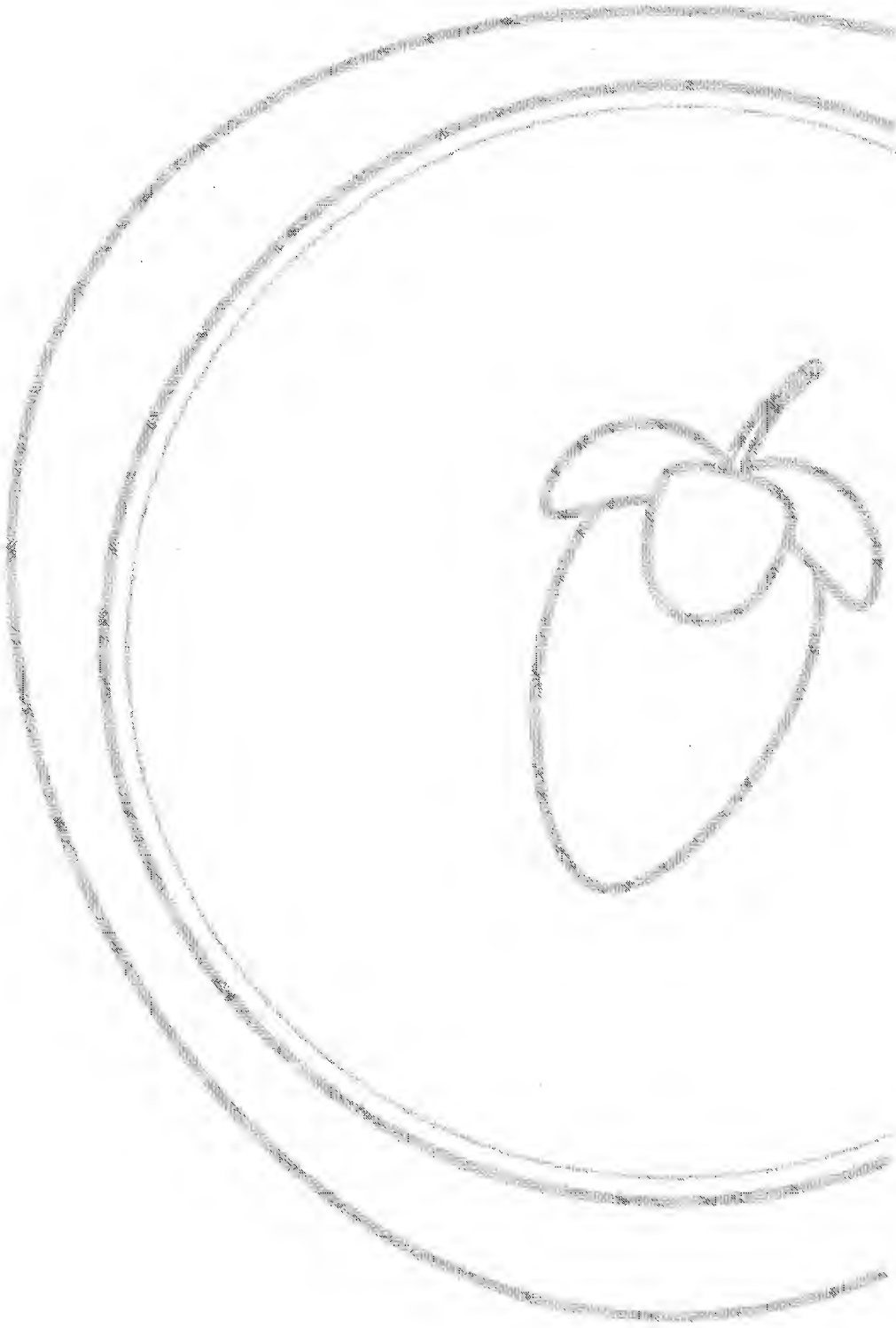
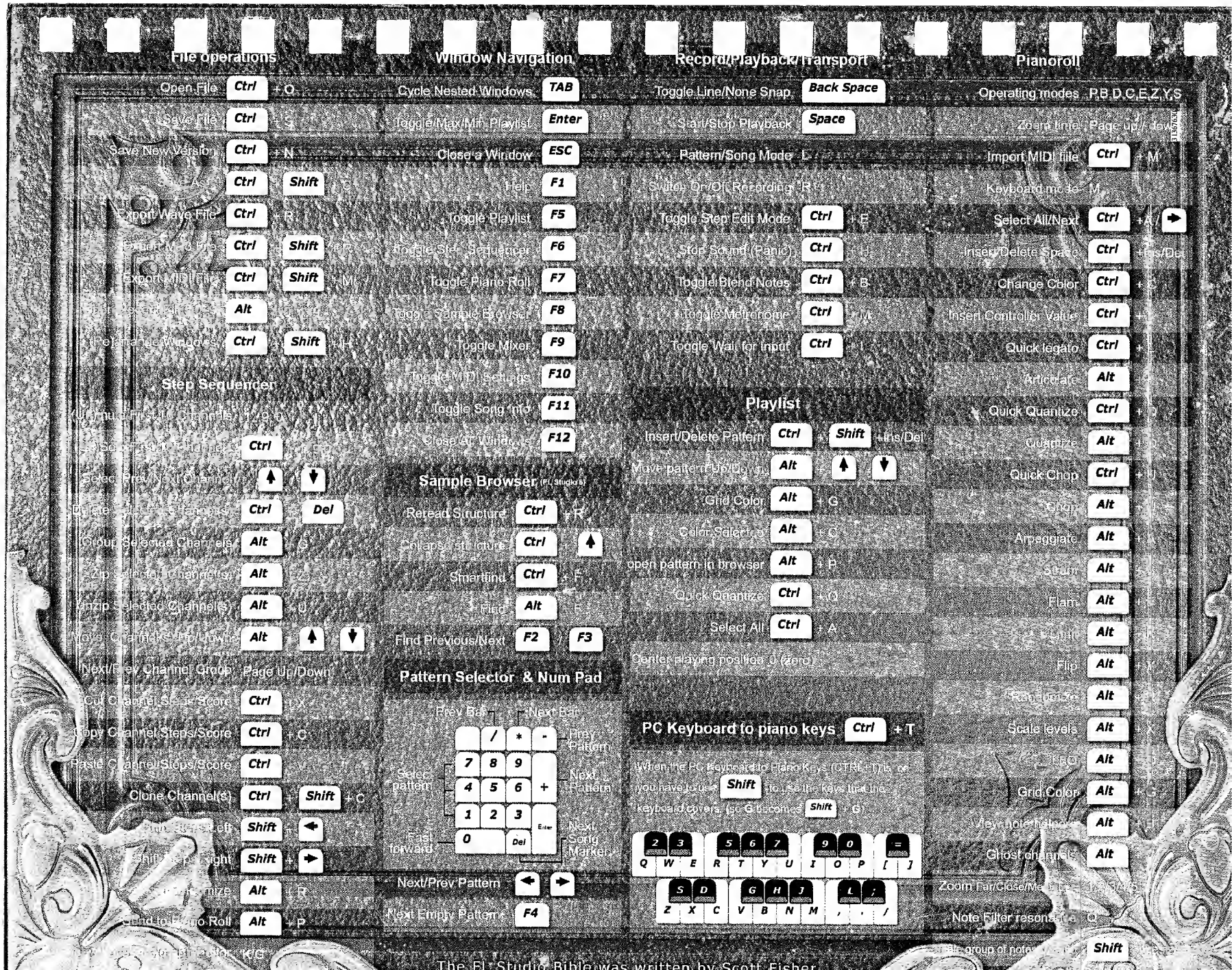
COMING SOON!

Thanks for purchasing this book, we'd like to leave you with a sneak-peek at some of the cool new features coming in FL Studio 6…



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Open File Ctrl + O
Save File Ctrl + S
Save New Version Ctrl + N
Save As... Ctrl Shift + S
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Export MIDI file... Ctrl Shift + F
Export MIDI file... Ctrl Shift + M
Export... Alt + F
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Select Prev/Next Channel Alt ↑ ↓
Delete Selected Channel(s) Ctrl Del
Group Selected Channel(s) Alt + G
Zip Selected Channel(s) Alt + Z
Unzip Selected Channel(s) Alt + U
Next/Prev Channel Group Alt ↑ ↓
Next/Prev Channel Group Page Up/Down
Cut Channel Steps/Score Ctrl + X
Copy Channel Steps/Score Ctrl + C
Paste Channel Steps/Score Ctrl + V
Clone Channel(s) Ctrl Shift + C
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Shift Steps Right Shift →
Randomize Alt + R
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Cycle Nested Windows TAB
Toggle Max/Min Playlist Enter
Close a Window ESC
Help F1
Toggle Playlist F5
Toggle Step Sequencer F6
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Toggle Sample Browser F8
Toggle Mixer F9
Toggle MIDI Settings F10
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Collapse Structure Ctrl ↑
Smartfind Ctrl + F
Filter Alt + F
Find Previous/Next F2 / F3
Pattern Selector & Num Pad
Prev Bar
Next Bar
Prev Pattern
Select pattern
Next Pattern
Fast forward
Next Song Marker
Next/Prev Pattern ← →
Next Empty Pattern F4
Record/Playback/Transport
Toggle Line/None Snap Back Space
Start/Stop Playback Space
Pattern/Song Mode L
Switch On/Off Recording R
Toggle Step Edit Mode Ctrl + E
Stop Sound (Panic) Ctrl + H
Toggle Blend Notes Ctrl + B
Toggle Metronome Ctrl + M
Toggle Wait for Input Ctrl + T
Playlist
Insert/Delete Pattern Ctrl Shift Ins/Del
Move Pattern Up/Down Alt ↑ ↓
Grid Color Alt + G
Color Selected Alt + C
open pattern in browser Alt + P
Quick Quantize Ctrl + Q
Select All Ctrl + A
Center playing position (Zero)
PC Keyboard to piano keys Ctrl + T
When the PC Keyb. acts as Piano Keys (CTRL + T), or you have to use Shift to access keys like the keyboard covers (ie. G becomes Shift + G)
2 3 5 6 7 9 0 =
Q W E R T Y U I O P [ ]
S D G H J L ;
Z X C V B N M , . /
Pianoroll
Operating modes P,B,D,C,E,Z,Y,S
Zoom time Page up / Page down
Import MIDI file Ctrl + M
Keyboard mode M
Select All/Next Ctrl + A / →
Insert/Delete Space Ctrl + Ins/Del
Change Color Ctrl + C
Insert Controller Value Ctrl + I
Quick legato Ctrl + L
Articulate Alt
Quick Quantize Ctrl + Q
Quantize Alt + Q
Quick Chop Ctrl + U
Chop Alt
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Flam Alt + F
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The FL Studio Bible was written by Scott Fisher